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TIME has hardly elapsed sufficient to test practically the influence on our national councils of the great development recently given to the system of competitive examinations. There can be little doubt that the universal consent of those competent to judge in the matter, which led to its introduction almost simultaneously in so many branches of the public service, is in the main a conclusive evidence of soundness in the principles on which it is based. And in many cases the notorious failure of methods which it was suggested to replace, and the temptation offered to persons high in rank and office by the agencies of patronage and nepotism, made the substitution more necessary and less difficult. Nor can it be denied that those departments of the public service which most specially interest us as medical practitioners, and to which the system has been extended, are as yet gainers by the alteration. The class of men admitted lately into the Indian Medical Service, and the corresponding branches of the Queen's forces, naval and military, has, according to good testimony, been decidedly superior in the aggregate to that of some years back. And though many causes were at work to bring about this desirable change quite independent of the qualification required on entering, still the latter, in the instance of our Indian forces, has undoubtedly exercised the principal and most beneficial influence.

Contemporary and connected with this change has been an increase of attention given to examinations in general. Not only in the public service, civil and military, are various tests required and liberal encouragements offered to distinction, but professions formerly beyond this power have voluntarily adopted a similar scheme. The various legal societies in particular now set forth an elaborate programme of an educational and competitive character, infinitely in advance of the time-honoured processes of "keeping terms" which had prevailed among them. And in our profession the change is hardly less real and important, though circumstances have prevented its forming so visible an innovation. There is scarcely one of the multitudinous corporations whose privilege it is to recruit the society of modern Asclepiadæ, which has not within the last year altered, remodelled, or improved its mode of examination, and put in its claim to general approbation by a more efficient test, and more complete protection afforded to the public against the ignorance and misdemeanours of uninstructed and discreditable licentiates.

It seems, therefore, not devoid of interest to lay before our readers some remarks on the methods and requirements of the several examining bodies, as deduced from a comparison of the papers proposed to candidates for their several diplomas during the past year. A list of these forms the heading of the present observations. It does not profess to represent all these corporations. A comparison based merely on collated questions without the answers, must, even if exhaustive, be inconclusive. But it is only necessary to show that those under notice present a fair specimen of the demands made on the examinees in the several instances, in order to justify an expression of opinion as to their tendency and appropriateness.

Before, however, proceeding to closer consideration of details, some remarks on professional examination in general may not be unacceptable. It must be conceded that the test afforded by an examination, however carefully conducted, is not of the most precise and delicate nature. It may, indeed, and if well-managed should always, be sufficiently exact to prevent any serious incongruities. But in proportion as the subjects on which it is concerned rise in the scale of importance, in their intellectual refinement, and in the magnitude of the mental effort necessary for their comprehension, so do causes of unavoidable error arise and multiply themselves. In the young, or in subjects of the most complete exactness, such as that of mathematics, a very considerable degree of accuracy is indeed attainable by the process of examination. Hence it is not uncommon to find the awards and honours of an university exactly confirming the relative merits and proportional standing of young men who had previously matched themselves at some large public school. Instances could be adduced of a class list very fairly reproducing the picked men of two or three such institutions in their old habitual order of succession while boys. And the elaborate subdivision of merit awarded in the Cambridge mathematical tripos is justified by the facilities of the subject-matter for such exact comparison. Nor is it, we believe, uncommon for the first few places on the list to be pretty well appropriated in public opinion before the decisive competition. But when we rise to a later period of life, or to a subject involving more of those individualisms which hardly bear classifying, examination becomes far more complex and liable to inaccuracy. For not only is there room for much difference of opinion as to the data and principles of the questions themselves, but the highest merit often lies in something which cannot be enclosed in a written paper, or even evolved in a *vivâ voce* answer. This latter state of things is eminently exemplified in the art of medicine. Numerous as are the sciences essential and collateral to its proper prosecution, various as are the lines of successful investigation and research, these are not the whole elements of the examiners' problem. There are a tact, a power of observation, a patience, an energy, a rectitude of purpose connoted by the highest appreciation of the medical character, which can at most be only obscurely guessed in any form of examination. It is best, therefore, not to attempt a decision where certainty is so difficult, and injustice far from improbable. Fortunately the requirements of the case do not demand such an adjudication. The right of the public is to be protected from dangerous ignorance; and the duty of the examiner is to send out into the world all who rise above the fitting standard, qualified to practise, at least with safety, even if unlikely to achieve any great success.

Here lay the fallacy of the paradox with which a late Cabinet Minister startled his subordinates, and drew no little notoriety on himself. Lord Malmesbury failed to see the real point involved in the examinations for the diplomatic service. Their object was simply to attack ignorance and incompetence in certain requisites of everyday occurrence, and these only when carried to an intolerable and irreclaimable degree. It was perfectly true, as he affirmed, that there were qualities needed for the successful practice of the diplomatic profession far more delicate and individual than reading, writing, and arithmetic; but it did not follow that the two either were, or could be separated. Indeed, the pre-existence of the latter acquirements was necessary, or nearly so, for the proper exercise of the former and more exalted endowments. In a word, the examinations were *exclusive*, and intended merely to cut off from the general body certain incompetencies justly considered incompatible with the exercise of even the highest intellect. It is just within the bounds of possibility that here, as in all similar adjudications, latent social merit, or great undeveloped capacity for political intrigue, might co-exist with an imperfect knowledge of the art of spelling. But these exceptional cases did not need to be legislated for, as they were clearly out of the ordinary course, and ought to be referred to what has, in some museums, been termed the "teratological" compartment.

The same remarks apply accurately to our own case as medical men: and hence the examinations with which we are now concerned being for the most part of a "pass" character, promise to work exceedingly well, and are susceptible of considerable adaptation to their proposed ends. Of those which vary from this standard we shall have to speak hereafter, and more especially of the "Honours" list at the London University, and the competitive examination for the post of Assistant-Surgeon in the Indian army.

It is very important to obtain, early in the discussion of these topics, a clear conception of their bearings. When, in pursuance of this view, we state that examinations may be considered as compounded of questions and answers, we shall probably be accused of uttering a truism of the plainest character. And yet this distinction, in an accurate sense, is not without its value. Under the head of questions come naturally the disposition of subjects for inquiry, the proportion of each to the other, the methods of asking, whether by "paper-work," *vivâ voce*, or practical examination. In the domain of answer lies the serious and difficult task of ascertaining the amount of work necessary and essential as a minimum standard of qualification. This latter is at the present time grievously vague and unsettled in our profession: so numerous are the examining bodies, so great is the competition between them, and so diverse are the provisions of their statutes, that even we of the profession feel great hesitation in "evaluating" in practical terms the weight to be attached to the possession of one or more diplomas. Much may still be attained in this direction, through the instrumentality of the Medical Council, who have already done good service by their summary rejection of certain incomplete qualifications among foreign and transatlantic diploma-giving authorities. A good deal is also in the power of the leading Universities and examining bodies. In their hands lies the direction of public opinion, and the formation of general views which imperceptibly influence the judgment of competent observers. We shall have to recur to this point when analysing the papers put forth by some of these corporations. Essentially the standard or minimum of answers seems to be influenced, first, by the afflux of candidates to each licensing body; and secondly, by the general impression abroad as to the stringency or otherwise of the test. These can only be controlled by the general supervision of the whole profession, expressed either in the mandates of their council, or implied in the value attached to any particular diploma. Indeed, the point is not without importance to every individual practitioner. We are justified in regarding any licence too easily obtained as lowering the general average of professional attainment, and in consequence, our probable estimation in the public mind. For our corporate value as a profession so far follows the hydrostatic law, that it cannot rise far, if at all, above the social level of the lowest inlet to practise. It is indeed true that some diplomas have, and will continue to have, an exceptional and intrinsic standing; but they are not the less influenced by the estimated worth of others at the same time in the market.

Our concern at present is mainly with the department of questions, as above stated. Nor is this valueless without its complementary division. For in the correct scheme and scope of the examination lies much of its usefulness. It is an essential and pre-existent element of success. It is indeed true that, in spite of elaborate papers of questions and a well-distributed field of investigation, an examination may be made worthless by the smallness of the minimum,—by the incompetent amount of answers accepted as sufficient. But, on the other hand, it is hard for an examination to be a good practical test and discrimination, unless the method of questioning and the means of comparison be judiciously selected.

Examination papers, moreover, when published and freely circulated, have influence in several secondary directions quite independent of their original object and intention. In the first place, they exercise a wholesome check upon the examiners themselves: it is perhaps inseparable from this very character itself that there should be a constant tendency to exhibit more the knowledge, the dexterity, or the extended views of the examiner, than to perform adequately the proper office of calling out with the least difficulty and confusion the ideas of the examinees, and giving every one of them, whatever his tone of mind or his individual predilections, an opportunity of exhibiting his acquirements in the most favourable light. The task which Socrates of old imposed upon himself as a teacher of philosophy, is eminently and essentially that of an examiner. When he lays claim chiefly to the *μαιευτικὴ τέχνη*, and congratulates himself, not so much on his own original offspring of thought and imagination, as on having aided the birth and fostered the growth of healthy thought in others his juniors, he says what every honest examiner should never omit from his reflections.[*] Probably no means are so powerful to secure this correct temper as the consciousness that his work will be seen by others than those most specially interested, and will be deliberately criticised by persons equally capable as himself to form an opinion on the subjects in hand.

A parallel check and guiding influence is exercised on the examinees, which is even of greater importance. This consists in the direction which published papers give to the reading and observation of those who purpose at some future time submitting themselves to the ordeal in question. This end is accomplished more fully by the free circulation of the papers than by any other means. Indeed, while papers of questions give little or no clue to the exact stringency of the test, they are the best guides to the views and general bias of the corporation by which they are framed. It may fairly be said that there is much personal character in these documents, whether pertaining to a single powerful individual, or handed down traditionally and unconsciously through the various stages and generations of a corporate existence.

In approaching the more specific subject of medical examinations we have the less difficulty, from the fact of all recent alterations having been very much in one direction; and that, such as to commend itself to the good sense of all who are interested in the subject.

This improvement is most marked in the greatly increased demands of the various universities and corporations for general education. This, although from the circumstances of the case always an essential element in the curriculum of the older collegiate institutions, had until recently been too much neglected by some examining bodies. Hence it formed the subject of a special recommendation from the Medical Council: "That all medical students shall pass an examination in general education before they commence their professional studies." There is perhaps no point on which our reputation with the public as members of a liberal profession more depends. While on matters purely scientific and professional, even the best informed are liable to go astray, and can at most only trust to information derived from such among ourselves as they may have access to; every one can judge for himself something of the acquirements and grasp of intellect in ordinary literary topics of the medical man whose therapeutic attainments it may be his interest correctly to estimate. And it has been already sufficiently insisted on in previous numbers of this Review how essential it is at all times for the practitioners of our art to be able to stand on a social equality with those who require their assistance, and with the members of the other liberal professions, whose contact and co-operation is unavoidable.

It is therefore not without interest to compare the regulations of the principal examining bodies in respect of general education.

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[*] *Τῇ δὲ γ' ἐμῇ τέχνῃ τῆς μαιεύσεως τὰ μὲν ἄλλα ὑπάρχει ὅσα ἐκείναις, διαφέρει δὲ τῷ τε ἄνδρας ἀλλὰ μὴ γυναῖκας μαιεύεσθαι, καὶ τῷ τὰς ψυχὰς αὐτῶν τικτούσας ἐπισκοπεῖν, ἀλλὰ μὴ τὰ σώματα.*—Plato, *Theætetus*, p. 150.

In the Universities of Oxford and Cambridge the question required less to be mooted than elsewhere. Their course of education has always proceeded naturally to terminate in medicine, with the parallel faculties of law and divinity; the faculty of Arts being common to all, is usually reckoned a necessary preliminary. Indeed, as at Oxford for the degree of Bachelor of Medicine, three years' residence, and the same examination as for the degree of Bachelor of Arts are required, the latter may be considered as nearly compulsory.*

At Cambridge, indeed, some relaxation appears to be made; for although nine terms, or nearly three years of residence, are required, still the latter half of this period, after passing an examination of a general character, may be devoted to study of subjects more akin to the student's ultimate destination in the lecture rooms of the University.

Practically, however, the medical diplomas of both these bodies are, and seem likely still to be, confined to individuals who have proceeded through the usual routine of university discipline; and an opinion has already been expressed in these pages as to the inexpediency of making changes by which medical students might be admitted who were less closely bound up with the general body of university men. These remarks do not, of course, apply to the middle-class examinations recently instituted in both Universities, and which are now very judiciously accepted by the College of Surgeons of London, and the Edinburgh colleges, as sufficient evidence of previous education. They are in every way adapted to form a good introduction to subsequent attendance on hospital lectures and practice.

The University of London differs entirely from those mentioned above, in requiring no residence whatever. In this point, however much it may in the opinion of some persons fall away from the prestige of the older foundations, it is clearly well-suited to the wants of a large class entering the profession of medicine. Preliminary education is here secured by the matriculation examination, rendered compulsory on every candidate for the degree of Bachelor of Medicine who commenced his professional studies subsequently to January, 1839, unless he possess a degree in arts from one of the universities of the United Kingdom.

The topics embraced by the examination are mathematics, natural

* Not but that the recent establishment in this university of a school of natural science is doing much for the preliminary education of medical men. It supplies what was wanting in the old course of study, an opportunity for men ultimately looking to medicine as their profession, to carry on some amount of work in physical science parallel and combined with the more general topics of a liberal education. We have the examination papers of the last year now before us, and although more pressing matter prevents an analysis of them, still it is none the less a duty to express a high opinion of their merits, both immediately as forming an excellent test of the abilities and acquirements of candidates coming forward, and also more remotely, though not less really, as tending to direct the study of future labourers in a right and healthy course. As their main value will lie in this latter influence, we should not be sorry to see them published in a more permanent and accessible form. We are, moreover, rejoiced to learn from the remarks at Bridgewater of the present Regius Professor of Medicine in Oxford, that he proposes to himself another object in these and similar labours—namely, the encouraging a right tone of thought, and correct information on scientific subjects among the general mass of well-educated gentlemen. We agree with him in thinking that this means will effect much for the public appreciation of efforts and researches strictly professional.

philosophy, chemistry, and classics. The range of these acquirements appears at first sight somewhat extensive, but it is much reduced by the fact of a programme being annually published, in which certain very limited portions of the classical authors are pointed out on which the examination will be conducted. For instance, in the two examinations of the present year, the subjects will be Xenophon's Hellenics, book ii., Virgil's third Georgic, and the fifth book of the Æneid.

In looking over the papers for the past year, as collected in the 'University Calendar' for 1860, we feel bound to pronounce a favourable opinion of them. Those for the honours students have indeed the appearance of being difficult beyond the ordinary measure of a matriculation test. But this seems somewhat accounted for by the large number of undergraduates on the books compared with those who proceed to higher degrees, and also by the fact of honours being given separately in every one of the subjects comprised in the general list. We conclude from this that the examination is intended partly as a final award to many students whom the necessities of position and business prevent from carrying their studies beyond their sixteenth or seventeenth year.

The pass examination is well calculated for its end: beginning with three translations from French, and two from German authors, it proceeds to an excellent simple Arithmetic and Algebra paper; this is followed by one on English History, containing ten varied and general questions; the Greek paper has at first a crabbed aspect, but this is much mitigated by the fact of its being set, not from Homer at large, but from a very limited portion of the Iliad, specially proposed eighteen months before, and therefore susceptible of more minute study. A very easy Chemistry paper follows, and then one headed Euclid, which seems too long for three hours' work. The next is on Experimental Philosophy, simple, but calculated to show a good general knowledge of the subject. Next comes a paper on "Roman Classic and History," containing a passage of Cicero de Amicitiâ, followed by several good grammatical questions, and two on Roman History. Lastly, there is a set of questions on the English language, commencing by a passage for dictation, with some sensible and not over-complicated grammatical problems. We are glad to be able to express our approbation of this part at least of the curriculum of the great metropolitan examining body; and while we differ in our views of the expediency of some other arrangements, we can confidently point to the matriculation as a trial which may with advantage be undergone by every student proposing to follow the profession of medicine, who has not graduated elsewhere.

An ordinance touching on the same subject of preliminary education, has recently (August 6th, 1859) appeared from the Scottish University Commissioners, with reference to graduation in medicine in the University of Edinburgh. It states that—

> "The Commissioners statute and ordain, with reference to the granting of degrees in medicine in the University of Edinburgh, that from and after the

fifteenth day of October in the present year, the following shall be the regulations under which such degrees shall be conferred—

"1. That the preliminary branches of extra-professional education shall be English, Latin, Arithmetic, the Elements of Mathematics, and the Elements of Mechanics; and that the proficiency of students in these branches shall, as far as possible, be ascertained by examination prior to the commencement of their medical study.

"2. That no candidate shall be admitted to a professional examination who has not passed a satisfactory examination on at least two of the following subjects, in addition to the subjects mentioned above—Greek, French, German, higher mathematics, natural philosophy, logic, moral philosophy; and that the examination on these latter subjects also shall, as far as possible, take place before the candidate has entered on his medical curriculum. The examinations shall be conducted by examiners in arts, together with some of the medical examiners.

"3. That a degree in arts (not being an honorary degree) in any one of the universities of England, Scotland, or Ireland, shall exempt from all preliminary examination."

As this has not yet come into force, we can give no further information of the manner in which it is to be worked; but the subjects are well chosen, and of such a nature that a competent knowledge of them may reasonably be demanded of every student.*

A very similar provision occurs in the regulations for the recently instituted "double qualification in medicine and surgery by the Royal Colleges of Physicians and Surgeons at Edinburgh." Of this excellent scheme we may have to speak more particularly further on. Here we need only make some extracts from the notice which appeared on September 1st, 1859.

After general remarks on the objects and character of the plan, the document concludes with these words:—"It is the earnest desire of both colleges that the students who present themselves for their diplomas should bear in mind how essential a liberal education—literary and scientific—is as a preparation for the successful prosecution of the study of medicine and surgery." Reference is then made to the regulations which follow, in which a more precise programme is drawn out; English and Latin grammar, elementary mathematics, natural or moral philosophy and logic, at the candidate's option; and after August, 1861, Greek or French, German or Italian, also at his choice, form the basis of the subjects; comparative anatomy, natural history and geology, "though not enjoined, are recommended for study." The examination, to take place twice a-year, may be undergone at any time before the first professional examination, but it is strongly recommended that it should be taken before the commencement of professional studies. A list of degrees which exempt, follows; detailing—1. A degree in arts of any recognised university. 2. Oxford responsions or moderations. 3. Cambridge previous examinations. 4. Matriculation of the London University. 5. Oxford and Cambridge middle-class examinations, senior and junior; and Durham middle-class senior examination; with the entrance examination of Dublin University. 6. Any university examination equivalent to No. 5. 7. A certificate of having passed the preliminary examination of any of the licensing bodies under the Medical Act.

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* The alterations of the other Scotch universities are not as yet in so forward a state as to admit of criticism. But the following observations, which we owe to the courtesy of a member of the medical staff of the Edinburgh University, put the matter in a fair light. "As regards Glasgow, Aberdeen, and St. Andrew's universities, the transition common to all has not yet advanced so far as at Edinburgh. An ordinance bearing the like authority is expected to be speedily promulgated. Its requirements will vary, but not greatly, in the case of each university."

It is singular that, both here and elsewhere, we find no mention of geography. This subject, over and above its common interest to all educated men, is in its physical and climatological departments of especial importance to medical men. The distribution of disease, and its modifications by telluric agencies, are only now beginning to attract a small share of the attention they deserve.

The College of Physicians of London has never been called upon to publish such minute information respecting the preliminary education required for its licence. The reason of this is probably to be found, partly in the high standing of the college diploma, which has usually been sought by persons also possessing university degrees; partly in a received traditional understanding that classical and general education is a *sine quâ non* for success with that scholarly corporation. The examination papers of the college, however, besides being in other respects good, both as regards the small number and clear character of the questions, have always contained a short passage of a Greek and Latin medical writer—the one for translation into Latin, the other into English. And it has been usual to require, in the therapeutic portion of the examination, some fully written Latin prescriptions, which should at once test the candidate's practical and classical attainments. It is possible that, at particular periods, the classical branch of the examination may have sunk somewhat into disregard, just as at others it has undoubtedly been elevated very considerably in importance; but we cannot help thinking, that while the diploma of the college continues to maintain the high and special position which it now deservedly has, it would be an error to hamper the examinations with any closer regulations as to general attainments. It is always in the power of the censors to give due weight to such considerations; and so much has always been, and must continue to be, left to their discretionary judgment, that we should be averse to innovations in this direction on the custom which has now obtained an immemorial use in the college. If, however, the scheme of a joint diploma from the London Colleges of Physicians and Surgeons should be carried out, as we sincerely hope it may be before long, the case becomes entirely different. An excellent course of preliminary teaching might be demanded in virtue of this arrangement, framed, in part at least, out of the regulations recently approved by the London College of Surgeons, to which we will now proceed.

According to a notice bearing date December 8th, 1859, it is determined that candidates who shall commence their professional education on or after the 1st of January, 1861, will be required to produce certificates of having passed certain specified examinations. These are essentially the same as those above quoted from the Edinburgh calendar, with the addition of the preliminary examination for the fellowship of the college itself. Although the matriculation of the University of London is not mentioned by name, we conclude it is included in the second heading, which sanctions certain matriculation and other examinations, British and foreign.

In default of these certificates, the college itself proposes to hold, in 1861, a preliminary examination of candidates for the diploma of member, of which the programme is given. Reading; dictation; English grammar and composition, with arithmetic; European geography; and outlines of English history, form the first division, which is apparently made compulsory on all who present themselves. The second part consists of four translations, from Cæsar's 'Commentaries,' St. John's Gospel, Voltaire's 'Charles XII.,' and Schiller's 'History of the Thirty Years' War,' respectively; and also of four other subjects —namely, elementary mathematics, comprising Euclid and algebra; mechanics; chemistry; and natural history. One at least, not more than four at most, of these subjects will be required of every candidate. This course is not rendered obligatory until 1861; but in June, 1860, a voluntary examination on the same basis will be held for such candidates as may wish to present themselves.

A similar, but rather more difficult examination, has always been held preliminary to the fellowship of this college, from which graduates of universities only have been exempted. As no change has been made in this, and its provisions are probably well known, we will not proceed to any separate comment upon it.

There can be little doubt that the additional demand of good general education by this college will prove in the highest degree beneficial. Practically, it is through this gate that far the greater number of students in London and the provinces of England enter the medical profession. And reform was no less needed in the general than in the professional standard of education. We have before, in this Review, intimated our opinion that if the usual routine of apprenticeship in the country previous to beginning medical study in London were broken in upon, and for some of the time thus spent a substitute were found in one or two years of preparation for such an examination as that of which we have just sketched the outline, the profession would not materially suffer in its precise and technical information on subjects purely medical; and would gain an incalculable advantage in a more enlightened tone of thought, a more logical temper, and an extended range of general information among its younger members.

In proceeding to a review of the strictly professional branch of these examinations, it may be well to point out one or two matters on which difference of opinion is likely to arise. Much discussion has been excited by the varying character of examination papers on all subjects; for not only must such documents, as has been already said, be strongly impressed with evidences of the personal character, local associations, and traditionary prescriptions of the examining body, but different theories are held of what should be attempted in them. Some examiners require mainly a narration of facts; most persons, indeed, have come across men to whose minds a large mass of facts, even if crudely and irregularly strung together, is satisfactory. Others, again, estimate highly the power of grappling with a general question, involving principles rather than facts, requiring careful arrangement in the disposition of the subject, trenching less upon memory, and calling into use the faculties of order and reflection. The right adjustment of this difficult balance in our department of knowledge seems to lie in the combination of both alternatives. Facts and accurate observations of nature are nowhere of higher value than in the science of medicine, but alone they will do very little. It is a common fallacy, more implied than spoken, which gives entire credit to this fact-gathering propensity. But as it of itself is incompetent to the highest results, and unable to rise to generalizations frequently called for even in the common course of practice; so we incline to an opinion that the examination paper intended to test the highest class of merit should include some call upon the more constructive faculties. Indeed, to write a good paper requires a little of the essayist's talent; a habit of viewing subjects in a simple, orderly, and logical light, with an ability of words and versatility of thought sufficient to give these conceptions a forcible and comprehensive expression. When we consider how often this combination of parts is exactly that upon which will turn the success or otherwise of a medical man in after life, we can hardly fail to approve that examination paper which gives scope for the exercise of such capacity, and makes its absence clearly evident by the fewness, meagreness, or confusion of the answers. But it would be injurious thus to countenance an idea that theories can be accepted in any degree for facts. This were to fall into the sophism which is at the basis of the homœopathic quackery. Fortunately, there is a branch of every well-ordered medical education where there is no room for doubt or hesitation—this is anatomy; and in proportion as we give loose the reins to the more discursive powers of candidates' minds in general subjects, so should we keep them in hand in the more precise, by the steady application of this curb. The practical result of this view is, that an essential part should consist of strict and detailed anatomical work, illustrated, if possible, by actual dissection. The latter course has always been adopted in the examination for the fellowship of the College of Surgeons in London; and even if the much larger number of students applying here and elsewhere for the diploma of member should present practical difficulties to its efficient carrying out in this case, it may be well supplemented by demanding demonstrations and descriptions from good preparations.

Another difficulty lying deep in the nature of the subject consists in the correct valuation of the faculty of memory. It is undeniable that something must be allowed to depend upon this power, and no scheme will prevent one student from gaining an advantage, more or less fairly deserved, over his fellows by its fortunate possession in a higher degree than is ordinary. But within the limits of the faculty itself are so many varieties, ranging downwards from a process nearly akin to reasoning, in which the mind needs to fix on a central idea as a bond of connexion for many and various facts, and by this instrumentality can retain them; to an almost instinctive gift by which some individuals are enabled to repeat without error the advertisement sheet of a daily journal. Papers may be pointed to which favour both the latter and the former of these powers, and with very different results, for the former seems to be at the root of the "medical enthymeme;" of that rapid induction which, on the aspect of certain conjoined symptoms, is able to refer back to similar cases, and to estimate the present instance by a judicious comparison of its precursors; whereas the latter under the same circumstances is dangerous in the extreme, rests on no firmer foundation than the descriptions of systematic works, always of necessity more or less overstated, has no selective power for shades of difference, and is always liable to be thrown out by a "*casus improvisus*," more frequent in our art than in that of the jurist. We should the more insist on this point if we believe, with some metaphysicians, memory to be less a faculty and innate, than an acquirement, capable of direction, development, and cultivation. It is indeed true that no system can completely guard against the false knowledge occasionally displayed by men of extraordinary memory. We must be content to consider this as one of those fallacies inseparable from the roughness of an examination test; but much can be done towards this end by a judicious arrangement of questions, by a steady adherence to facts and observations, and by so modifying the line of inquiry as to take it out of the routine of the cut-and-dried theories and general explanatory views of systematic works. It is for this latter reason that the practical branch of examination affords so valuable an indication of real merit.

A simpler and more obvious, though not less necessary caution, is required in apportioning the absolute lengths both of the papers and of the individual questions; in both ways it seems that too much is not uncommonly demanded. On the one hand, seventeen or eighteen answers must be very brief and concise to be practicable; and on the other, even one or two questions, each of which is really a thesis for an essay, will encourage vague and discursive writing, or occupy so much time as to leave the examiner in the dark as to the attainments of the candidate in the other subjects propounded. Three hours is usually the outside of space allowed for writing; and even if more be granted, there is room for doubt whether most ordinary minds are able to keep up so long any continuous and valuable mental effort at the "high pressure" of an examination. Moreover, all must have remarked how time is commonly lost at the very beginning by what may be called the "shock" of receiving the papers; few men not already practised in these wrestlings are able to put forth their strength till after a pause of vague wonderment, followed by a quiescent interval to "collect one's ideas." Now, the same forces which appear in this aspect at first issue in considerable fatigue after two or three hours—fatigue which, as in the muscular system, will first show itself, not by absolute inability to proceed, but in hasty, ill-regulated and unequal performances. Hence it seems a fair plan to give, either at the head of the paper or elsewhere, some intimation of the amount expected. In the Cambridge examinations this is by common understanding known to be "*majorem partem*," or rather more than half; and a somewhat similar proportion obtains at Oxford. In some of the examination papers of the London University a like end is attained in another way. At the top of the chemistry questions for the first M.B. examination it is printed, that of the three questions subjoined "two at least should be fully answered." And in the excellent physiology paper for the second M.B. examination of the last year, six questions being printed, the candidate is required to answer three "fully and satisfactorily." By this means sufficient range is given for fairness to all, without in a disproportionate manner overstraining the efforts of the better informed. We must reserve what further remarks remain to be made until a short analysis of the more important points in each examination has been attempted.

The examination for the degree of Bachelor of Medicine at Oxford occurs at present only once a year, in the month of June. The papers of the last occasion are before us, and we regret that space would interfere with their quotation *in extenso*. They are seven in number, headed respectively—1. Anatomy and Physiology; 2. Chemistry and Botany; 3. Pathology; 4. Therapeutical; 5. Clinical Examination at the Radcliffe Infirmary; 6, 7, are respectively passages of Latin and Greek medical writers for translation and comment. In the Anatomical paper are ten questions. The first requires some account of a tissue actually shown under the microscope, with its functions and distribution. The corpuscula tactus, Pacinian bodies, nerve vesicles, and the cells of connective tissue, form the second. The third asks the relative anatomy of the supra-renal capsules, and the structures met with in exposing them. The glosso-pharyngeal nerve follows next. The fifth is a description of the secreting structures of the stomach, with the composition of gastric juice. The functions of the parotid, submaxillary, tonsillar, and Peyerian glands, furnish the sixth; and the agencies in the capillary system influencing the general circulation the seventh question. The power of cerebro-spinal and sympathetic nerves respectively on the secretions and nutrition of the organs to which they are distributed, follows; and after that a comparison of the blood in the superior cava with that in the inferior cava and aorta, of that in the splenic artery and splenic vein, of that in the portal and in the hepatic veins. The last is an account of the different stages of development in the human vertebral column. These are the ten—three purely anatomical and seven physiological—questions. The Chemistry and Botany paper contains twelve. The first asks for explanation of certain chemical terms; the second, tests for the poisons of strychnia, arsenic, tartar emetic, and morphia; the third, for the means of obtaining pure kreatine, glycerine, urea, uric acid, and bone-earth. The chemical components of the blood, their proportions in a healthy man, and the method of quantitative determination, follow next; and after this the processes of vinous and acetous fermentation, the transformations involved, and the formula of the products. The chemical changes in the manufacture of chloroform, iodide of potassium, "mistura ferri," and "black wash," form the next question; and the amount of carbonic acid in expired air, with the method of interchange in the lungs, the seventh. The different thermometric scales, the chief ingredients of the most noted mineral springs in Europe, the sources of nitrogen, carbon, and hydrogen in plants, the motion of fluid in plants, and the channels by which this is effected, and a description of the Solanaceæ, with their contributions to medicine, close the paper. We have here five chemical, two chemico-physiological, two pharmacopœal, and three botanical questions.

The pathology paper contains eight questions: diphtheria, with its post-mortem appearances, and the microscopic character of the membrane, comes first; then follows a good inquiry as to the coagulation of fibrin within the vessels during life, and the changes it undergoes before death. A contrast is next proposed between sanguineous effusion into the left half of the pons Varolii, and extensive softening of the right half of the spinal cord in the upper dorsal region. Fatty degeneration furnishes the next; and the various conditions of muscles in hemiplegia the fifth. The sixth is on the subject of delirium in its various forms; the seventh demands a tabular statement of symptoms and post-mortem appearances in poisoning by alcohol, lead, aconite, decomposing animal matter, and inhalation of carbonic acid. The explanation of a pathological preparation exhibited concludes the paper. Eleven questions are therapeutical: the different classes of apoplexy, the value of "casts" in urine, the diseases of the heart in which mercurial courses are of advantage, the signification and etiology of "struma," the history of diabetes, the distinction between a severe attack of gout and of rheumatism, with the complications of either, and chlorotic disturbances of the heart, form the first seven. The expectoration of calcareous matter, its conditions and prognosis; a system of diet and of hospital diet tables; and the arrangement of hospital wards as regards beds, cubic space, and ventilation, follow after these. Lastly, a description of certain exhibited calculi is asked, with the practical results of their composition.

In the clinical paper a case is proposed for diagnosis, usually of marked characteristics, such as phthisis, chronic pleurisy, or acute rheumatism; the history is required to be written first, then the present symptoms, followed by the diagnosis and prognosis. At the same time certain sputa are offered for comment; and one or two microscopic objects of medical importance conclude this branch of the examination. Of the translation papers from Latin and Greek medical authors respectively there is not much to be said. In each case a commentary is demanded; the former on the ancient and modern views of bloodletting, the latter as regards purgatives. And it deserves remark, that such portions of the ancient writers are chosen as best agree with modern science, and exhibit most favourably the practical experience and close observation which distinguished the practitioners of former times in a far higher degree than we are sometimes disposed to give them credit for.

Taking these papers together, it is satisfactory to be able to express a high opinion of their character. Indeed, we regret our inability to quote them *in extenso*. There can be little doubt that the publication of these and similar documents may afford a valuable direction to the studies of all who look forward to a medical career, whether with the purpose of graduating at the university or not. Nor is there any obvious reason why copies should not for the future be transmitted to one of the weekly medical journals soon after the examination, as is already done in the case of the excellent papers for the admission of candidates into H.M. Indian service. The subject would doubtless have sufficient interest to recommend it for publication by those periodicals, especially as the demand for space would not be great, and would only occur once in every year. We feel assured that such publicity serves an important end, by assisting in the necessary although difficult object of fixing a standard of competency and diffusing a correct estimate of the character and extent of information indispensable for success.

The 'Cambridge Examination-papers' are divided into two sets, representing respectively the first and second examinations for the degree of M.B., as appointed in that university. By this arrangement, which is now common to several other examining bodies, the more abstract and theoretical subjects which form the solid foundation of a medical education, are taken first and separately after three years of medical study. The papers for the year 1859 are six in number, consisting of Anatomy and Physiology, Chemistry, Pathology, Materia Medica and Pharmacy, and Botany, with a translation paper from Greek and Latin. To these, for the future, the elements of comparative anatomy will be added, and will form a seventh subject, which was for particular reasons not demanded of the candidates on the last occasion.

The Anatomy and Physiology consists of thirteen questions. The foramina and canals of the orbital cavity, the diaphragm, the branches of the abdominal aorta, the thoracic duct, the fifth pair of nerves, the longitudinal and transverse commissures of the brain, the pia-mater, choroid plexuses and velum interpositum, the arachnoid and subarachnoid of the spine, and cerebro-spinal fluid, furnish respectively matter for the eight first or anatomical questions. The five last, which seem more specially physiological, are the membranes of the stomachal wall and the secreting apparatus; the portal and hepatic venous canals, with some other points in the structure of the liver; the chemical principles of respiration; the structure of the supra-renal capsules, their glandular nature and probable office; and the fœtal circulation. The Chemistry questions are thirteen in number; they commence with a problem in the laws of combination, followed by some points in the physical history of phosphorus, chlorine, and hydrosulphuric acid. A practical testing question comes next, and then the means of detecting vermilion, arsenite of copper, chromate of lead, prussian blue, sulphate of lime, and alum, &c., used to adulterate food. Allotropism and isomerism, the doctrine of substitution, and homologous series, form the next three subjects, which are succeeded by prussian blue and the estimation of prussic acid. The artificial production of oxalic and formic acid and of urea, tests for opium, strychnine, albumen, and bile, and some relations of kakodyle, of which the formula only is given, conclude the paper.

The Pathology paper contains fifteen questions. Definitions are first asked of infection, contagion, and miasmatic influence, the effects of moderate and intense cold on vital processes, the modes of death by asphyxia, asthenia, and coma, the formation of the buffy coat in inflammatory blood, each form in succession subjects of inquiry. The fifth stands as: "enumerate and give a brief description of the different kinds of tumours, and distinguish a simple cyst from an encysted tumour." The pathology of excretory ducts, and effects of their lesion on the gland, the derangements of the functions of the intestines by absence and excess of bile, the lesions of dysentery in the intestine and elsewhere, the morbid appearances of recent endocarditis, and "the more chronic lesions of the valves of the heart, with their effects on the muscular structure of this organ," succeed these; tubercle forms the tenth, and the next asks the different effects arising from lesion of the seventh and fifth pairs of nerves. Fatty degeneration and its common seat, anæmia, acute pleurisy, and albuminous urine, conclude the paper. Materia Medica and Pharmacy have eleven questions allotted to them. The pharmacopœial weights and measures stand at the head; hydrochloric acid, the liq. hydrarg. bichloridi, and iodide of potassium, each form one. The fifth is the tests for arsenious acid, followed by the preparations of opium and its salts, with their doses. The varieties of cinchona barks and the properties of quinine occupy the next place, and after them the properties and order of ricinus, digitalis, conium, mezereum, and taraxacum. Six simple pharmacopœial preparations for verbal analysis, the emetics of the pharmacopœia, and a description of five specimens, apparently vegetable, with their natural history, bring the paper to a close.

In Botany only five questions are given. The first of these is in several sections, requiring the principal characters of five exhibited specimens, the second the natural orders of datura, strychnos, aconitum, rosmarinus, and cochlearia; the distinction between solanaceæ and scrofularineæ follows; and the effect of a warm climate on the common hemp, with an explanation of the function of respiration in plants, complete the list. The translation paper contains one Greek and two Latin passages, but does not require any special comment from the candidate or from us.

The second examination occurs at the completion of the course of medical study. It is represented in the last year by three papers—pathology and practice of physic, medical jurisprudence, and surgical diseases, with obstetrical medicine. Besides this there is a clinical examination, "to which," according to the statement of the Regius Professor of Medicine, "much importance is attached by the examiners, and indeed, on the results of which the success of the candidate may mainly depend."

The first paper contains twelve questions, beginning with the discrimination of rheumatic affection from commencing disease of the hip-joint; the symptoms and treatment of diphtheria; the pathology of dry gangrene; the conditions of hæmatemesis and melæna; the characters of herpes zoster; "the predisposing circumstances, exciting causes, premonitory signs, morbid anatomy, and treatment of apoplexy;" the effects of pressure on the brain; colica pictonum; the use of sedatives in fever; the symptoms of inflammation of the spinal cord; the remedies in cardiac and renal dropsy; and lastly, the varieties and remedies of chronic bronchitis, compose the list.

The Medical Jurisprudence is contained in seven questions, which are as follows:—Poisoning by strychnia; chronic lead-poisoning; the cause of the difference in waters passing through lead pipes in regard of impregnation with that metal; the evidence of live birth to be derived from an examination of the body in infanticide; the signs of pregnancy, and their degrees of value; the evidence of an incised wound or a burn on a dead body having been produced before or after death; the substance of the certificates for consigning a lunatic to an asylum, with their exceptions and restrictions; and lastly, the points of distinction between real and assumed mania in a prisoner on a criminal accusation.

Under the title of Surgical Diseases and Obstetrical Medicine, are ten questions, of which the following is an abstract:—The differences of boils from carbuncles, with the treatment of each; amaurosis and sclerotitis distinguished from a scrofulous affection, with the several modes of treatment; polypi, their kinds and seats; the meaning of the term malignant tumour; the microscopic appearances of schirrous cancer; true aneurism—Valsalva's treatment of it, the operation to be recommended; psoas abscess, its causes; symptoms of scrofulous affections of the hip-joint, with the results of treatment; calculus in the bladder—the high operation for lithotomy, why safer in children than adults; the ages when prostatic affections are most frequent; club-foot—tenotomy; distinction of ovarian dropsy from ascites, the appearance of the interior of an ovarian sac, and the character of its contents; the value of paracentesis in the latter disease; natural labour, causes of interference with it from position or conformation of fœtus, when the forceps are justifiable; "state the most important diseases to which females recently delivered are liable;" the principles of treatment in puerperal fever and mania.

With this we conclude the analysis of the Cambridge Papers; cursory as this has necessarily been, no one can fail to recognise the essentials of a fair and complete test; especially commendable is the division of the subjects into two classes, theoretic and practical, each restricted to its own occasion—so much so, that we should be inclined with all deference to suggest the adoption of some such scheme both at Oxford and elsewhere, if it do not already obtain.* The anatomical questions also seem well chosen and judicious, perhaps slightly superior to the corresponding portion of the Oxford papers: nine out of thirteen are very specific, and calculated to form a shrewd trial of that dry acquirement of details which, as it demands only the lowest intellectual effort, but in a patient and protracted form, is apt to be especially repugnant to some minds, in proportion as they have reached a certain degree of general cultivation. On the other hand, the pathology and therapeutics of the latter university do not seem of quite so high an order as those of the former; the Oxford papers on these two subjects are, to our judgment, deserving of close imitation. Nor is the Oxford Chemistry paper inferior, containing as it does a few but excellent questions. Botany, moreover, is here despatched in three questions, a number abundantly sufficient; indeed, it is probably owing to historical causes that this department of medical education continues to hold too important a place in many examinations. The modern prescriber is as surely the descendant of the "simpler" and herbalist of former days, as the surgeon is of the barber; but the practical conditions of the division of labour have undeniably divorced the two pursuits, in the former as in the latter case. At the present time all that is required of botanical knowledge by a medical man may be investigated under the heading of materia medica and pharmacy, and with more appropriateness. It is true that all branches of natural history tend to perfect the observing faculties and complete the character of the "physician;" but we persist in the opinion that minutiæ of botany may well be spared the ordinary student, and relegated to the excellent examinations of the Pharmaceutical Society, and to the natural functions of Apothecaries' Hall—functions from which the latter institution has by favourable circumstances been so far elevated as to justify the theories of a recent publication on physics, and to clothe itself in the attributes of a more elevated species.

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* Documents have reached us, too late for incorporation with the body of our observations, which, if they should be sanctioned by the vote of the University, will greatly modify and improve the course of medical education at Oxford. The examination for the M.B. degree is to be divided into two parts—the former scientific, the latter practical. The range of topics embraced will be proportionately extended, and certain immunities will be offered to students who have taken high honours in the Natural Science School.

At the University of London, as at Cambridge, the examination for the degree of M.B. is divided into a first and second trial. Both take place once a year. For the first, several certificates are required: of being nineteen years old; of general education; of two years' medical study after a degree in Arts, or the matriculation of the university itself; of nine months' dissection; and of attendance on practical pharmacy. Thus far the requirements are unobjectionable. But the fourth rule deserves to be taken alone, from the probable difference of opinion which will exist as to its provisions: it requires certificates of attendance on a course of lectures in "each of four" of the subjects in the following list: descriptive and surgical anatomy; general anatomy and physiology; comparative anatomy; pathological anatomy; chemistry, botany, materia medica, and pharmacy, general pathology, general therapeutics, forensic medicine, hygiene, midwifery, &c.; surgery, medicine. Now there can be no hesitation in stating broadly an estimate of the little value to be attached to certificates of attendance, even on such a complete course of medical lectures as is sketched out, week by week, in the "Schedules" of the College of Surgeons and Society of Apothecaries. Nor, indeed, is it necessary to go into details of the arguments against the usefulness of such documents; they are well known to all who have had the trouble of fulfilling their conditions, whether as teachers or as students. It is a recognised fact at most schools of medicine, that while they cost much delay and waste of time to the more diligent, they are almost invariably evaded by the indolent and unscrupulous; and that they throw so much odium and ill-feeling on individual lecturers, if they feel it their duty to act by the letter of the law in regard of them, that many of the most conscientious find them a serious annoyance; and others not less desirous of doing the best for the students and for the profession generally, acknowledge their utter uselessness and futility, and fall into the pardonable weakness of signing hastily or without discrimination. A certificate of attendance on medical and surgical practice, vague as it must be at best, may indeed be wisely enforced; but the same rule does not apply to lectures. We regret to see the University of London sanctioning, even in a partial and incomplete way, a system which will, we hope before long, be entirely exploded.

In the calendar of the University for the year 1860, recently published, we find the papers of the last examinations: The first, for the degree of M.B., appears to consist of two sets of anatomy and physiology questions, one on chemistry, one on materia medica and pharmaceutical chemistry, and one on botany. These papers are followed by "*vivâ voce* interrogation and demonstration from specimens" in all the subjects except botany. The first two papers contain each five questions, of which four are anatomical, one physiological; the astragalus, its articulations and their ligaments; the dissection to expose the submaxillary gland and duct, with descriptions; the internal surface of the bladder and urethra, with the bulb and the parts behind, seen from below; the parts seen between the base of the tongue and lower border of the cricoid cartilage, from behind, with the deeper dissection of this region; and a general account of serous membranes, form the first paper; the second begins by a description of the tenth, eleventh, and twelfth dorsal vertebræ; which is followed by the dissection of the recti and obliqui capitis postici, and the neighbouring vessels and nerves; the dissection of the anterior crural nerve and branches, mentioning the parts as exposed, and their relations; the dissection of the duodenum and pancreas, their relations and vessels, with the internal surface of the duodenum, and the parts lying immediately behind these structures; and lastly, the structure of lymphatic glands.

The Chemistry paper contains only three questions: the analysis of a complex mineral water, qualitative and quantitative; the detection and separation of elements in an alloy of silver with small quantities of tin and bismuth, and the physical properties of the several metals; the method of analysing the blood, the characters of its constituents, chemical and microscopical, the salts of blood, and the processes for their separation and quantitative determination. At the head of this paper is the notice to which we have already alluded, stating that two at least of the questions should be fully answered.

The Materia Medica paper contains four questions: an enumeration of ten medicinal aperients, with tests for adulteration and substitution; the preparations of iron in the Pharmacopœia, their doses, and the decompositions involved in their manufacture; the vegetable tonics, distinguishing those containing tannic and gallic acids, the botanical class of the plants, and their family; it concludes with an extract from the Latin Pharmacopœia for translation.

The Botany paper first asks some definitions of terms; and then the description of fifteen specified characteristics, as exemplified in certain numbered specimens, the nature and amount of which are not stated.

The above constitutes the Pass examination; candidates who satisfy the examiners in this trial are arranged in two divisions, in the first of which are placed "such candidates only as, in the opinion of the examiners, are admissible to the examination for honours."

The general impression produced by these papers is favourable: the anatomical questions have the high merit of requiring results of absolute dissection, and not systematic descriptions, such as may be learned by memory from books; but they seem rather unreasonably long; nor do we believe that even the best anatomists could properly answer the half of them in the allotted three hours, except by a very slight and perfunctory enumeration. From the latter fault, the chemistry paper is saved by the device of which mention has been made.

The Materia Medica paper is particularly easy and simple; perhaps too much so for a subject so practical and important; certainly, a student unable to answer it very fully would be utterly unfit for the license to practise, and should hardly be allowed to proceed to the more advanced subjects of the second examination.

The Botany has the merit of briefness; it is further simplified by the judicious provisions specified in a note appended to the regulations. By this, a syllabus is propounded, out of which the examinations will not travel: it consists of about 150 terms for explanation and definition, a list of the most important natural orders, of which only descriptions will be expected, and a scheme for describing, in which are contained the most marked and obvious characteristics.

"Any candidate who has been placed in the first division at the first M.B. examination, may be examined for honours in any or all of the following subjects: anatomy and physiology, chemistry, materia medica and pharmaceutical chemistry, structural and physiological botany. The examinations shall take place in the week following the commencement of the first M.B. examination. They shall be conducted by means of printed papers; but the examiners shall not be precluded from putting *vivâ voce* questions upon the written answers of the candidates when they appear to require explanation. In determining the relative position of candidates, the examiners shall have regard to the proficiency evinced in the same subjects at the pass examination."

The regulations, from which the above is an extract, then proceed to define the method of classifying the students, and to propose three exhibitions of thirty pounds per annum for two years, for the candidate who shall distinguish himself the most in the three main subjects, "if, in the opinion of the examiners, sufficient merit be evinced." Under the same circumstances, the first and second in these subjects receive each a gold medal of the value of five pounds. In Botany, no exhibition, and a single gold medal is awarded.

The Honours papers include two in anatomy, each consisting of a single dissection; the former, the internal base of the cranium with its dura mater, nerves, and other attached parts; the latter, the parts situated in the lower half of the arm, and in the forearm, from the insertion of the deltoid to the lower ends of the radius and ulna.

The Chemistry questions are again three in number; of which the first requires the methods for separation and quantitative determination of chlorine, bromine, and iodine; the second asks the methods of determining the presence and proportion of carbon, hydrogen, oxygen, nitrogen, sulphur, and phosphorus in an organic compound, with the principles regulating its atomic weight and equivalent; the third requires an explanation of some complex formulæ, and the properties of the substances so indicated.

The materia medica begins by the natural history of honey, wax, musk, and castor, with a chemical description of the first two; then follow the physical properties of alcohol, ether, chloroform, oil of turpentine, with the effects of heat and cold on them. Lastly, the medicinal preparations of copper, with their chemical description.

A very long botanical paper concludes the series, consisting of no less than seventeen questions. It seems, however, so little connected with a medical view of this subject, that we must be excused analysing it.

We will proceed at once to the second examination for the M.B. degree, reserving any remarks till after this. It occurs two years after passing the first examination; for it are required similar certificates to those before alluded to. It consists of physiology, including comparative anatomy, general pathology, therapeutics, and hygiene; surgery, medicine, midwifery, and forensic medicine, with translations of the pharmacopœia from and into Latin. At the pass examination for the last year, the Physiology paper contained six questions. These were—first, the proximate constituents, nutritious and non-nutritious, of bread, and its changes traced through the alimentary canal; next, the placenta in man and animals; the structural peculiarities of arteries, capillaries, and veins in man; the experiments showing the great dependence of the state of the arteries on nervous influence; the teeth in man; and lastly, the corpuscula tactus and their assigned function.

The Pathology paper contains three subjects—the alterations in the heart's structure from disease, anæsthetic agents, and the prophylaxis of tropical dysentery.

In Surgery we have four—suppuration; caries and necrosis, with illustrative cases; diseases of the knee-joint, with "as comprehensive a view of such cases as the time for this examination will permit;" and urinary calculi.

In Medicine, six—cerebral softening, intestinal hæmorrhage, pneumonia, intestinal obstructions, infantile remittent fever, and syphilitic diseases of the skin.

In Midwifery, four—premature expulsion, the means of stopping hæmorrhage before labour, the difficulties during the last stage of labour, and the causes of menorrhagia.

In Forensic Medicine, five—poisoning by chloride of zinc; death by asphyxia, accidental or violent, contrasted with death by drowning; the distinction of arsenical poisoning from inflammation arising from disease; the signs of recent delivery; and the proofs of a child found dead having been born alive.

Besides these papers there are two oral examinations. The first on "cases of actual patients, and morbid products;" the second by demonstration from preparations, and translation of the pharmacopœias. Of the latter three specimens are given: the first an English translation of the process of making chloroform, to be retranslated into Latin; the second and third, the description of cinchona pallida and creasote, to be rendered into English.

The regulations for honours at the second M.B. examination seem the same as those for the first; and in physiology, surgery, and medicine, three exhibitions of 50*l.* per annum for two years are offered, as well as two gold medals in each of these subjects, and a seventh for the midwifery examination.

The first Physiology paper contains four questions: the structure and functions of the spinal cord and medulla oblongata, the development of the mammalian skull and face, the development of the genital organs and descent of the testes, and the structure of the tongue. The second has the same number, of which the first asks an account of connective-tissue; the second, the structure and development of bone, dentine, enamel, and shell; the third, of the heart; the fourth, of the trachea, bronchi, and pulmonary cells, with the mechanism of respiration, and the chemistry of its changes. The three surgery questions of the first paper are the diseases of the thyroid gland, amputation in the thigh, and Cheselden's operation for lithotomy below the pubes. Those of the second are adenocele, purulent ophthalmia, and talipes varus.

In Medicine, two papers contain each two questions; the first of these being "the phenomena of ulceration in the sub-diaphragmatic portion of the alimentary canal," its most frequent seat, and symptoms; and epilepsy. The second begins with the treatment of dropsical effusions, and proceeds to the varieties of urinary deposits, the symptoms of calculus passing through the ureter, and the treatment of the various calculous diatheses.

In Midwifery, a single paper of four questions contains, the circumstances directing in a presentation of the cord, either to leave the case to nature, to apply forceps, or to turn; the object and modes of inducing premature labour; malignant puerperal fever; and phlegmasia dolens.

With this terminates the series of competitive struggles undergone by the candidate for the degree of Bachelor of Medicine in the London University. It is true that another and more severe test awaits him if he proceed to the final degree of Doctor. Logic and moral philosophy; commentaries on cases in medicine, surgery, and midwifery; two papers in medicine; practical clinical examination; and *vivâ voce* interrogations present so imposing an aspect, that we must be allowed to veil our timidity under the pretext of deficient space, and to leave this part of the subject unanalysed. But we should fail in candour if we omitted a strong expression of the opinion that in this institution the system of examination, excellent within proper limits, is greatly and injuriously overdone.* It is true that the student is repaid for the *peine forte et dure* of the question by a liberal supply of scholarships, exhibitions, and gold medals. Within the last twenty years the calendar contains fifty-two scholarships given away at the first and forty-eight at the second M.B. examination, in all one hundred, or at the average rate of five a year. The gold medallists form a legion difficult to reckon up, but considerably exceeding twice the number of the scholars. This amount is not only unreasonably large in itself, but is even more remarkably out of proportion to the numbers of candidates who offer themselves for the diploma. One error lies at the root of the whole; and that is, the awarding of prizes and honours in every separate and individual subject, as well as on each occasion of coming before the examiners. This we believe to be a direct premium on "cram," and calculated to lead the diligent student out of the main road of professional knowledge and ultimate excellence in a hunt after the passing glitter of a competitive decoration. And we are certainly not the first to notice that so lavish a distribution of honours tells with the non-professional world very differently from its original intention. It is difficult to persuade the mass of educated men that scholarships awarded generally at the rate of five or six annually, and backed up by eight annual gold medals for the second competitors, can imply a very high standard of merit in the individuals, or a very searching test in the examinations. At the best, the world looks for justification in after-life of the eminent praise and honour obtained so early; and this would indeed be a fortunate university, wherever it were situated, if it could count distinguished sons thronging around it as abundantly as it disseminates its titles and distinctions.

The University of Edinburgh offers no special papers for analysis, owing to the stage of transition in which it now is involved. But the ordinance of the commissioners, from which we have already quoted, sketches out an excellent scheme of study and examination. Four years of continuous attendance on lectures, ascertained by certificates; medical and surgical practice for two years in a general hospital of not less than eighty beds; three months' dispensing; six months' application to out-practice, private or at a dispensary, form part of the course. One year's study in Edinburgh, certain other documents, and a thesis, are also required; but chiefly an examination

"both in writing and *vivâ voce*. First, on chemistry, botany, and natural history; secondly, on anatomy, institutes of medicine, and surgery; and thirdly, on materia medica, pathology, practice of medicine, clinical medicine, clinical surgery, midwifery, and medical jurisprudence. The examinations on anatomy, chemistry, institutes of medicine, botany, and natural history, shall be conducted, as far as possible, by demonstrations of objects placed before the candidates; and those on medicine and surgery, in part by clinical demonstrations in the hospital."

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* Among the amendments proposed in the medical degrees at the University of Oxford is one admirably calculated to meet a real difficulty. While it is obviously unwise to exact a fresh examination for candidates for the Doctorate in Medicine, it is perhaps unadvisable to make the graduation purely formal and perfunctory. Accordingly, the thesis always demanded heretofore is to be read publicly, and printed for further circulation. It is expected, and we think justly, that such a course will oblige the Professor to appeal to public opinion in the case of every person whom he presents for the M.D. degree; will thus raise the character of this degree, and make it a reality; and without subjecting persons already in practice to the annoyance of a public examination, will afford to able and industrious candidates an authorized means of doing credit both to themselves and the University.

Students are to be allowed to divide this into three parts, by submitting to examination on the first division of subjects at the end of their second year, on the second division at the end of their third year, and on the third division at the completion of the fourth annus medicus. Or, if they prefer it, they may take the first two divisions at the end of the third year, or the three altogether at the termination of the whole career. Rejection is to be for a complete year of study.

By the new regulations for the double qualification of the Edinburgh colleges, to which allusion has been already made, the candidate has to undergo two professional examinations, both in writing and orally. The first embraces anatomy, physiology, chemistry, and botany; the second, pathology, materia medica, pharmacy, medical jurisprudence, midwifery, surgery, and medicine.

The first to take place after twenty-one months of attendance on classes; the second after the fourth winter session. The requirements differ little from those given above:

"In order to test more effectually the practical knowledge of candidates, anatomical and botanical specimens, articles of materia medica, chemical tests, the microscope, and surgical apparatus, will be employed during the examinations; and every candidate will be required to write out one or more formulæ of prescription. The examination may also consist in part of the actual examination of persons labouring under disease."

It seems unnecessary to make further comment on these regulations, which fully bear out the high character of the medical education given by the school of Edinburgh.

The College of Physicians of London presents three papers, corresponding to the statutable divisions of its examination. In all of these, the questions are followed by a passage from a Greek and Latin medical writer respectively, the former for translation into Latin, the latter into English. Four sets of papers given during the last year are in our hands, but space only permits a short analysis of one of these, that last published in December, 1859. The Physiological paper contains six questions:—The structure and connexions of the pons Varolii and medulla oblongata, and the nerves arising from them; the structure of muscular fibre, striated and non-striated, with the distribution of the latter in the tissues; the minute anatomy of the human lung; alimentary substances in their various classes, and the changes they undergo in digestion; the constituents of blood, and its changes in different parts of the system; and the probable causes of the cardiac sounds.

The Pathological questions are seven in number:—The conditions of albuminous urine; the various causes of coma; the causes of peritonitis, with the manner and extent of variation in symptoms corresponding to the cause; phlebitis and asthma, their causes and symptoms; the symptoms and diagnosis of hysteric and epileptic fits; and the distinctive marks of variola, rubeola, and scarlatina.

The Therapeutic portion contains five questions:—The different treatment of anasarca from various causes; the treatment of acute and chronic gout, with prescriptions written out in full; the treatment of an attack of gall-stones, and the mode of living suitable to such patients; the treatment of a case of apoplexy, and of recent hemiplegia without coma, and any variations which might be necessary; the average doses of opium, tincture of opium, chloride of mercury, mercury with chalk, and tartar emetic for patients aged six months, two years, seven years, fifteen years, and twenty-five years respectively, with the intervals at which the doses might be repeated.

Considering the specimen given above as what it really is, a fair average of the style and amount common to the examinations of this body, we can have no hesitation in forming a high estimate of its practical value. It must be obvious to all that the questions, though simple, are both specific and practical. Indeed, they contrast favourably in regard of the latter characteristics, with some which we have already cited. They neither offer theses for a treatise, nor riddles only to be solved by some lucky perspicuity, or by the fortunate knowledge of the individual opinions and investigations of the examiners. This has been our experience of many papers which space forbids us to extract on the present occasion. The test has never been inordinately difficult, but has always preserved an equality and general correctness of aim which has deservedly enhanced its own value; and, as we are inclined to believe, exercised a very healthy influence on the other seminaries and schools of medical learning. It was one of the greatest recommendations of the scheme by which the surgical and medical colleges of London were to unite in a joint diploma, that the examinations of the two bodies, as at present constituted in their several departments, are of excellent character and organization. It must be the wish of every professional man who looks to the success and dignity of his order, that a good result should follow on a measure so eminently calculated to enhance both the one and the other.

The extensive changes made by the Royal College of Surgeons are not limited to preliminary education. The recent document from which we have already quoted, proceeds to sketch out a line of professional study. Four years of such labour: three months' pharmacy; two winter courses of anatomy, and two of dissection; the same period of physiology lectures; and a single course of chemistry, materia medica, medicine, and surgery, form the principal requirements, with practice of surgery and clinical lectures on surgery at a recognised hospital during three winters and two summers, and similar medical instruction for a single winter and summer. The fulfilment of these demands, or the possession of certain surgical and medical diplomas, will admit to the professional examination. This is divided into two parts; the first, on anatomy and physiology, "is practical and demonstrative on the recently-dissected subject, and on prepared parts;" the second, or pass examination, on pathology, surgery, and surgical anatomy, is partly written and partly oral.

The first or primary examination will take place five times in the year, and is, we believe, to be passed at the end of the second year of study.

We have before us several papers from this College for the past year. The two given at the end of November last will form as fair specimens of the whole as can be desired, and their character will not in all probability have been much altered in any subsequent legislation.

The Anatomy and Physiology paper contains six questions:—The composition of the air breathed, and its changes in passing through the lungs; the structure of larger and smaller arteries and of capillaries, with their respective offices; the structures and functions of the skin; "examples of muscles of the body acting as levers of each kind;" the muscles which raise the soft palate; and the different kinds of cartilage in the human body, form the whole, of which four may be called physiological and two anatomical.

The Pathology, Surgery, and Surgical Anatomy paper contains the same number:—Acute, chronic, rheumatic, and strumous inflammation of the synovial membrane of the knee-joint; laryngotomy and tracheotomy; the source of hæmorrhage in injuries of the head, and the surgical interference needful for its relief; the treatment of wounds of the abdomen; the changes in the urethra from prostatic enlargements, with the treatment of retention of urine; and the injuries and diseases likely to be mistaken for dislocation of the humerus, bring it to a close. It may be said generally to contain two questions on each of the three included subjects. These documents seem to justify a tolerably favourable opinion; although not of the highest class, they are on the whole simple and precise. The fourth anatomical question needs to be excepted from this description, as we know of no such instances as are asked for; and in a like manner we are in doubt as to the meaning of the third question of the second paper; although the difficulty seems to depend on confused wording only, and requires no closer comment. Whatever individual faults may be found with this particular instance, there can be no sort of doubt that the whole system, as now revised, is vastly in advance of the old time-honoured farce carried on every Friday night at the College for so many years; as it has expired, we need waste no vituperation on its carcass, though there is ground to fear that the "evil it has done lives after it" in many a "grinder's" triumph, and in many a half-educated practitioner, now it is to be hoped sufficiently warned by experience to rue the day when carelessness, or false compassion, or the utter impossibility of finding weak points in an hour's conversational scrutiny, cast him forth upon the world with the responsibilities of the licence to practise, and knowledge unequal to its emergencies.

It is out of our power to carry this analysis to any greater length; this reason, and the probability of change from its present anomalous position, precludes any more than mention of the recent emendations in the examinations of the University of St. Andrew's; the other Scotch corporations and colleges are, on the testimony already cited, not improbably in a similar stage of transformation. And the examination of the Society of Apothecaries does not come within our present scope; it only professes to give the title which its name implies; and now that the right of its licentiates to claim remuneration for medicinal appliances is no longer exclusive, we sincerely hope its real position will be confined to its statutable claims. We understand the examination to be good and competent to its purpose; but every right-minded practitioner must protest against this licence being allowed to remain a door of ingress into the general profession of medicine.*

There is, however, one examination which, though it confers no licence to practise, is exercising a great, and we believe healthy, influence on medical education at large. This is the examination for admission to H.M. Indian Medical Service. Although some doubt seems abroad as to the real value of the appointments in this way conferred, there is none as to the demand in which they have hitherto been held; a demand sufficient, or nearly so, to fill such vacancies as have from time to time occurred. The conditions of the examination make it somewhat different in character from others which we have noticed. It is at once exclusive and competitive, "pass" and "honours." For the station on the list of successful candidates has an additional value in giving the right of successive choice of Presidency. This design is well stated in a notice to candidates put at the head of the papers, as published in 'The Lancet' for January 14th, 1860, which we will extract:

> "In determining the relative merits of the candidates, so far as they can be ascertained from answers to printed questions, regard will be had both to the number of questions answered, and to the accuracy and completeness of each answer. But it is not expected that all the questions will be fully answered by every candidate. For they are not only intended for ascertaining whether each candidate is qualified for an appointment, but for testing, by both their number and their difficulty, the relative abilities of the best candidates—a design which is essential to a competitive examination, and which cannot be fulfilled unless some questions are asked to which only the best candidates can give good and complete answers."

The first paper is on Natural History, and is headed with a request to answer five or more of the questions, which are in all fifteen. Of these eight are mainly botanical, three zoological, three chemical, and one asks for some scientific derivations and definitions. The second paper is on Surgery, and contains eight questions, one of which is a case for diagnosis. The Anatomy and Physiology consists of the same number, of which three are anatomical and three physiological, one in comparative, and one in surgical, anatomy. The Medicine paper contains six questions, of which one is a case described for diagnosis. For more minute details we must refer to the papers themselves. A note is appended to the printed regulations, which has some interest. From this it appears that in answer to inquiries "as to the object and extent" of the examination in comparative anatomy, zoology, and botany, the examiners state this to be, as it were, supplementary to professional knowledge, in case of such being needed; to promote the study of natural history, as

> "Being eminently calculated to develop habits of close observation, and to strengthen those powers of reasoning upon observed facts, which must be habitually exercised by medical men everywhere, but which must be exercised

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* The recent determination of the College of Physicians to admit a new order of licentiates from the ranks of those practising general medicine is an additional argument for the remarks here made. We feel sure this diploma will be in great request, and will tend to raise the character of the profession at large.

with the greatest energy and promptitude by those who practise in a tropical climate, and who are often thrown wholly upon their own resources."

As a corollary on these excellent remarks, the note continues by stating that,

> "The general examination in these sciences will be elementary, and will embrace a very limited range of technical terms. At the written examination, a considerable number of questions will be put, with the view of allowing each candidate to select such subjects as he has attended to, and thereby of enabling the examiners to ascertain the particular departments of science in which the verbal examination should be conducted. With those candidates who have attained proficiency in any branch of these sciences, the verbal examination will be pursued in the branch selected, so as to ascertain the full extent of their knowledge."

While we most cordially agree with the tenour of these instructions, we cannot fail to think that their spirit might be advantageously incorporated in many other examinations.

The pamphlet of Mr. Dale appears, from the preface, to have been originally composed in competition for the "Carmichael Prize" of the Council of the Royal College of Surgeons in Ireland. It is now published as "a book that will be found helpful to medical students, and the parents and guardians of young men, and of general interest to the members of the medical profession."

The author commences by noticing "the number and differences of the institutions which exist for granting licences and degrees, giving rise to unequal qualifications, a multiplicity of titles, and consequent errors and mistakes." He enumerates the twenty authorities in England, Scotland, and Ireland which have this privilege, including the Lambeth diploma, now suppressed. He then examines, in certain groups, the requirements of these various bodies. From this analysis some valuable information may be doubtless gained by the persons to whom the pamphlet is addressed; though it appears to contain little more than is furnished by the 'Medical Directory' of the present and former years. Some good remarks follow as to what is required of students:

> "We should rather say too much is required than too little, and especially by the universities; and it is worthy of inquiry and consideration whether the subjects which are taught, some of them called collateral, are not too numerous and diversified, and whether they do indeed make more efficient medical men. Whether, in other words, the various studies and exercises for the degrees in arts might not be dispensed with, or greatly abridged, and the time more usefully employed by the students in medicine; and whether such preliminary study is not exacted partly for the sake of upholding and supporting these institutions."

These observations must be considered to apply mainly to the London University, which has been previously assumed "as representative of the above-named institutions (the universities), because its regulations are more intelligible to general readers." In this sense we cannot but acknowledge their justice; and they are the more appropriate as coming from a gentleman who styles himself on his title-page "Undergraduate of the London University." There are, without doubt, many besides the author of the above pamphlet, good and competent men, who cannot look without some dread on the vast array of learning presented by the examinations of that corporation. In a later portion of the essay the same complaint is put more categorically.

After some notice of the propriety of making a more marked distinction between the prescribing and pharmaceutical branches of medicine than is at present practicable, the writer recurs to the question of preliminary education. With his arguments against this we are quite unable to concur. An interesting fact which he introduces incidentally, tells strongly in opposition to his views, but is equally corroborative of those which we have advocated. It appears that in France,

> "In 1852, the degree of Bachelor of Letters, which before that period had been required of all before they could take the degree of Doctor of Medicine, was dispensed with. Now it is pretended, after five years' trial, that this has lowered the *morale* of the profession; and a memorial has lately been presented to the Emperor, by the Minister of State for the Department of Public Instruction, praying that the preliminary degree in letters may be re-established, and the Emperor has granted the prayer of the memorial; and after November, 1861, all the aspirants to the doctorate must hold the diploma of Bachelor of Letters."

We are glad to be able cordially to enter into the spirit of the excellent remarks which follow under the head of "Moral Training," although they hardly come within the scope of our present subject, and must in consequence be set aside at present. The succeeding sections take up in a somewhat cursory manner various topics connected with the work of education in a hospital, including a vindication of the value of systematic courses as a means of instruction; and some recommendations, not dissimilar from those in the pamphlet of Dr. Harvey, for giving these a greater value, by a judicious combination of the tutorial function with the professional, thus ascertaining that the information formally given has been understood and digested by the bulk of the students present.

In the latter pages the writer adverts to points not so closely connected with our present object as to require analysis. We regret that we cannot agree in enforcing the recommendations there made. It seems more than doubtful whether physicians as a class would be much elevated by compulsory attention to general practice for the first twelve years of their professional career; nor do we wish to see a system adopted which already works unfairly in the parallel profession of the law, we mean the dependence of the higher practitioner on the lower for a summons to a client or a patient, as the case may be. And the proposal of a "Parliamentary enactment, or agreement among the licensing corporations themselves," by which physicians should be debarred from all practice but what was purveyed for them by the general practitioner who called them in, besides being somewhat too arbitrary for the principles of the British constitution, savours not a little of a desire to establish a safe and profitable monopoly.

Notwithstanding these differences of opinion, we are unwilling to give an unfavourable opinion of Mr. Dale's little publication. It comes from a member of that branch of our profession which may well show more interest in its general welfare, and more corporate spirit regarding possible amendments, than has hitherto been customary; and we feel strongly that all such statements tend to strengthen the voice of public opinion, and give a firmer hold on the numerous and different educational bodies to whom is delivered as a trust the upholding of our fraternity both in absolute numbers and in general estimation.

One other subject remains upon our list, embodied in the letters of Dr. Harvey on reform in relation to the medical schools and examining boards. This cannot be said to be a very recent publication, but it is not the less valuable and judicious for this reason. Indeed, there is room to believe that some of the suggestions contained in it have already borne fruit, and will continue to do so. At least, many matters here brought forward hypothetically are now established as facts. The writer shows how, in the actual state of the medical sciences, it has become impossible for students within the usual time to master all branches of study perfectly; and that many are demanded which rather hinder than advance their course. He therefore recommends a restriction of the number of lectures within reasonable bounds; and as a farther guide to the learners, the plan of grounding all such lectures on a specified "text-book." Some excellent remarks follow on the evils resulting from requirements too extended and too specific on the part of examining bodies, which, in the impossibility of their being properly responded to by the ordinary run of examiners, necessitate a vicious lowering of the standard in the amount accepted as sufficient. To this attention has already been drawn; nor can a more serious danger be conceived to the progress of true knowledge than the combination which, rightly or wrongly, is suggested by the ponderous examination system of the London University. The questions we have before us; and as it is obvious that talent little short of genius is needed for their satisfactory answering, we are driven to the conclusion that, in the absence of this, a compromise must be effected. Either "cramming" to a great extent must be resorted to, or a very small proportion of what is asked must be accepted as entitling to the diploma. We feel sure that we have Dr. Harvey's warrant for these remarks, and wish for no better corroboration than is furnished in his second letter.

He proceeds to recommend a combination of the Tutorial with the Professorial system of teaching, and draws some good distinctions between elementary and advanced courses of lectures. It follows from his data that the range of examination should be restricted and defined, and that some uniform standard should be adopted in the various licensing bodies. In this we so cordially agree that we can but quote his remarks:

> "One often hears it said, 'What matters it where one passes? One puts M.D. or Surgeon after his name, and no one knows or cares where he got his diploma or degree.' I will not particularize, lest I should give offence; but it is undeniable that some boards are lax as compared with others, examine on fewer subjects, have but one examination, and pass a larger proportion of candidates. The evils resulting to the course of medical education from the system of education as conducted by these less stringent boards lie in the

direction of laxity of application to study. With need for the utmost diligence during the whole period of student life, and with temptations to idleness more in number and greater than beset the students of any other profession—the anticipation of the ordeal that awaits them is the only inducement to exertion with most students, the only check they have against idleness."

In the fourth letter, Dr. Harvey shows very clearly that considerable abatements in the way of attendance on the systematic courses of lectures might very advantageously be made, and remarks on the admission of this fact by the practice of the Universities. On this point we have already made some remarks. Lastly, as regards the examinations themselves, he suggests that the student should be permitted to be examined once for all at the end of each year on the subject proper to it. He would thus be kept continuously at work, and would avoid the confusion of a multiplicity of occupation. This suggestion has been practically fulfilled, and has been detailed in the extracts from the ordinance of the Scotch Commissioners; indeed, some modification of it now obtains almost everywhere.

Here we must take leave of a clear and straightforward publication, and at the same time close our own observations. We shall be gratified if in the course of them we have drawn attention to the value of examination papers and the importance of their free publication. It is through the answers given to them by the candidates that the examiners and the licensing body exercise a hold over the general mass of students; but it is in the questions themselves, their scope and character, that the profession at large has a hold on the examiners. Here, as in other subjects, an uniform and equal standard can best be brought about by the influence of public opinion. And while we measure the success of a seminary by the intellectual cultivation of its sons, we can form some estimate of its corporate judgment, temper, and conscientiousness, by the internal evidence of the tests and ordeals which it employs for their discrimination.

REVIEW II.

The Anatomy of the Human Lung: an Essay for which was awarded the Fothergillian Gold Medal of the Medical Society of London. By A. T. HOUGHTON WATERS, Member of the Royal College of Physicians of London, Lecturer on Anatomy, Physiology, and Pathology in the Liverpool Royal Infirmary School of Medicine, &c.—*London*, 1860. pp. 233.

THIS work comes before us graced with no mean introduction. It is the essay *couronné* by the Medical Society of London with the Fothergillian gold medal. Internally it bears marks of careful research, both into the works of authors, and into those of nature. As the preface tells us, the writer has been careful to make no statement on his own authority, until repeated examination has convinced him of its truth. We feel therefore disposed to give a cordial welcome to our author's *début*, and we sit down willingly to make a fuller acquaintance with him.

An historical sketch of thirty-five pages presents us with a very full account of the works of previous labourers in the same field. Commencing with Hippocrates, and ending with Milne-Edwards, he enumerates the opinions of forty-four writers. No fewer than twenty of these have written since the commencement of the present century. If we go on at this rate, an historical introduction a century or two hence will be a formidable undertaking, almost a work in itself. We do not mean to quarrel with such preambles to the more special details of monographs, especially in prize essays, but we are rather inclined to believe that many readers pass very lightly,—should we say *skip* over these parts? anxious to get at once to the kernel and root of the matter. We cannot help calling to mind a confession made to us by one of well-deserved eminence in physiological science, to the effect that he was much given to looking only at the plates and their explanation, when studying papers and essays, and eschewing a more profound digestion of the *amas* presented to him.

Malpighi seems to have been the first who made out the main fact of *the textural* anatomy of the lungs.

"By diligent research," says our author, "he recognised that the whole mass of the lungs held together by vessels running through it was an aggregation of very fine and thin membranes, which, by their extension and tortuous course, formed an almost infinite number of *orbicular and sinuous vesicles* in the same manner as we see wax spread out to form the parietes of the cells of the honeycomb. These vesicles, he said, had a communication with the trachea and with one another. When examined with magnifying powers these vesicles appeared to him to be formed by the attenuated continuation of the internal membrane of the trachea, which was dilated at its extremity and its sides into cup-like sinuses, and beyond these terminated in unequal spaces and vesicles, so as to offer the appearance of a sponge. In his first letter (to Borellius), he speaks of a network surrounding the vesicles, which he thought was for the purpose of connecting them together, but he doubted whether it was a vascular plexus or a nervous (fibrous) tissue. In his second letter, however, having made observations on the lungs of living frogs, he recognised the plexus as consisting of bloodvessels. He describes the division of the lungs into lobules, and seems to have thought that the interlobular tissue consisted of true pulmonary vesicles, and that the air was received into and expelled from it as with the vesicles, and that the membranes of the tissue had a communication with each other."

Willis, who wrote about the same time, but subsequently to Malpighi, describes the bronchial tubes as ramifying minutely, and leading into the ultimate vesicles—i.e., into the numerous cavities discovered by Malpighi, which are in fact continued parts of the trachea. He used mercurial injection to demonstrate the arrangement. These two worthies seem to us to have taken the main step to a right comprehension of the pulmonary structure. Before their time, men "believed that the tissue or parenchyma of the lung was of a spumous or spongy character, and that in it the air became mingled with the blood." Crude and incorrect as this idea is, we must yet observe, *en passant*, that modern scientific observation has tended somewhat to harmonize with this view, inasmuch as it seems admitted that the living structureless membranes are not so purely solid and firm as was once thought, as they appear to give passage occasionally to shaped corpuscles, somewhat after the manner of a gelatinous layer, closing again without leaving an apparent breach.*

So, also, quite recently, Dr. B. Richardson has stated that if a fibrinous concretion in the pulmonary artery obstructs the blood-flow into the pulmonary plexus, emphysema occurs, which almost seems to imply that the presence of blood in the vascular plexus is essential to the due nutrition and textural consistence of the membrane of the air-cells. Subsequently to the labours of Malpighi and Willis, manifold observations have been made, and much discussion expended, to determine the exact form and disposition of the aërating vesicular structure, but as to real knowledge available for a comprehension of function we have made no great advance. The case is quite other than that of the liver or kidney, where a knowledge of the exact structure is most important to a right idea of the function;—here, however, when once we have got the notion of fine membranes forming an aërating surface to a surrounding vascular plexus, there remains no further essential point to determine quoad the anatomy.

In the description of the pleura, we do not find any notice of the careful and detailed observations of Luschka and Hamernjk, relative to the lines at which they are reflected from the sternum or ribs, and the extent of space included in the so-called anterior mediastinum.

Under the title of fibrous septum between the thorax and neck, Dr. Waters describes an independent fibrous structure connected with the inner margin of the first rib and the first dorsal vertebra, and internally blending with the fascia, passing down from the neck with the bloodvessels, &c. He differs from Dr. Sibson in not regarding this as a tendinous expansion of the scalenus anticus muscle, from which, he states, it can with care be dissected off.

As to the *size* of the lungs, he states that both are on the same level at the lower edge of their posterior border. "This is well seen in a pair of healthy lungs removed from the chest, and inflated; when measured they will be found of the same depth, provided the apex projects equally high on both sides." Of course the vertical diameter of the right, taken from the apex to the centre of the base, is less than that of the left. Our author describes as follows the interior of the bronchial tubes and their alveoli:

> "On opening the bronchial tubes their surface is found to be smooth and glistening; it is, however, in the large tubes usually seen to be raised by narrow bands of fibres taking a longitudinal direction. As the tubes become smaller these bands disappear, and the surface becomes perfectly level. This condition is maintained until just before the termination of the tubes, when by the aid of sufficient magnifying power a number of depressions may be seen; these depressions (the alveoli) give a sacculated appearance to the walls. In the smaller divisions of the tubes, when their walls have become attenuated, the same appearance presents itself beneath their coats as beneath the pleura, when examined under the microscope; an appearance which results from the transparency of the membrane forming the walls allowing the outline of the air-cells which rests upon them to be visible. . . . . The bronchial alveoli re-

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* See Virchow's Pathologie und Therapie, p. 231.

semble those of the ultimate pulmonary tissue; they consist of little cup-like cavities, resting upon the bronchial tube, and opening into its cavity; they are surrounded by their walls, and their shape is more or less oval, or circular, quadrangular, or polygonal. In a preparation in which the pulmonary artery has been injected, branches are seen to pass from that vessel to these alveoli before it reaches the air-sacs (air-cells)."

Dr. Waters recognises positively the presence of muscular fibres in the bronchi; even in the ultimate tubes they cease at the commencement of the alveoli.

Chapter VI. treats of the ultimate pulmonary tissue. After describing the appearances met with in sections of lungs inflated and dried (being previously injected or not), and giving some very good figures, which we can testify are very true to nature, the author proceeds to detail his view of the arrangement of the ultimate air-tubes:

"If we follow out a bronchial tube in a lung injected, inflated, and dried, and trace it to its termination in the ultimate air-tubes or cavities, by carefully removing the portions of lung which are upon it, and then the upper half of its wall, so as to lay bare its interior, we adopt, I believe, the best plan of ascertaining how the tube itself terminates, in what manner the cavities I have spoken of proceed from it, and what relation they bear to it. For this purpose we should expose a bronchial tube from its entrance into a lobule to its termination. We find that the bronchial tube having entered its lobule, divides and gives off branches, and at last terminates in a dilatation, which has opening into it a number of orifices. These orifices lead to a number of canals, which have been variously designated interlobular bronchial ramifications (Addison), 'lobular passages' (Todd), 'intercellular passages' (Rainey), infundibulums (Rossignol), Malpighian vesicles (Moleschott), terminal cavities (Mandl)."

The author objects to these names as not expressing clearly the nature of the structure they are intended to designate; he proposes to substitute the term *air-sacs*.

"These air-sacs consist of somewhat elongated cavities, which communicate with a bronchial ramification by a circular opening, which is usually smaller than the cavity to which it leads, and has sometimes the appearance of a circular hole in a diaphragm, or as if it had been punched out of a membrane which had closed the entrance to the sac; when this is the case, the sac dilates suddenly beyond the orifice."

The sacs are arranged in groups side by side, with thin membranous septal walls; their shape is polygonal, verging upon circular, but somewhat flattened by mutual pressure.

"The sacs increase somewhat in size as they pass from the bronchial tube to their fundus, the latter being usually the broadest part of the sac; but they are often found to have an almost uniform diameter throughout. All the sacs pass from the extremity of the bronchial tube *towards* the circumference of the lobule in which they are placed; they consequently radiate from the tip of each terminal bronchial twig. The sacs connected with one bronchial termination do not communicate with those of another; each set of air-sacs is therefore a little lobule or *lobulette*, which in fact represents the entire arrangement of the lung, and is a lung in miniature. As the air-sacs pass towards the boundary of the *lobulette*, they often bifurcate, and here and there circular orifices exist, which lead to smaller air-sacs, sometimes only to a small group of air-cells or *alveoli*, so small as scarcely to be considered a sac."

The walls of the air-sacs are exceedingly thin and alveolated, each air-sac containing from ten to twenty alveoli. With regard to the question whether the air-sacs communicate with each other, our author opposes the opinion of Williams and Addison as to such communication taking place. Any apparent orifices in the sacs are only those leading to offsets from the cavity of the original one. In the following passage Dr. Waters compares the pulmonary lobulette of the mammal with the pulmonary sac of the higher batrachian reptiles.

> "In the latter the air-tube ceases suddenly in a circular orifice, and the pulmonary sac is developed beyond it. This consists of a simple sac in which a number of secondary cavities are formed by the projection of the internal membrane into the interior of the sac. These cavities or 'sacculi' are of a polygonal shape; their base rests on the outer wall of the pulmonary sac; their mouth opens towards the long axis of the cavity; they are not plain and simple cavities, but have a number of depressions, or secondary chambers, or 'alveoli' within them, which are separated from each other by membranous septa, and resemble those of the air-sacs of the human lung. Each of these 'sacculi' may be fairly considered as the representative of an 'air-sac' or 'infundibulum' of the mammalian lung; and as a number of these open into the dilated extremity of the air-tube, the whole pulmonary sac comes to resemble very closely the lobulette of the lung, the sacs of which all open into the terminal dilatation of the bronchial tube."

Dr. Waters agrees with Dr. Williams as to the presence of an epithelium on the aërating surface, not only in the lungs of mammals, but also in those of birds and reptiles, as well as on the gills of fishes. He gives representations of the epithelial lining, which we must say are very unlike anything that our own examinations have shown us.

> "The epithelial cells," he says, "form a distinct and complete coating to the walls of the air-sacs and alveoli; they have not quite the same appearance as those of a serous membrane; they are smaller and more rounded in shape, and less distinct in outline," but have nuclei and granular contents like ordinary pavement epithelia.

From our own observations, we should be inclined to say that the constituent membrane of the air-cells was all but destitute of epithelium; occasionally an imperfect particle may be seen upon it, but except in diseased conditions, we cannot think there is any regular lining. We suspect that blood-globules remaining in the capillaries and nuclei of their walls have sometimes been mistaken for epithelial particles. Dr. Williams, in the article Respiration (organs of),* considers it a settled point that the air-cells are lined by an epithelium, and distinguishes it as hyaline. However the exact truth may be, there is no manner of doubt that the epithelium, if it exist, is wholly unlike the ciliated epithelium of the bronchial tubes, and that the original sagacious anticipation of Dr. Addison from pathological facts is confirmed, that the aërating pulmonary tissue is much more of serous than of mucous character. The author gives the following dimensions of the various elementary parts of the lungs in infants under one year of age, and in adults, which we throw into the form of a table:—

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* Cyclopædia of Anatomy and Physiology, p. 271.

	Infants.	Adults.
Ultimate bronchial tubes.	$\frac{1}{85}$ — $\frac{1}{120}$ inch	$\frac{1}{50}$ — $\frac{1}{100}$ inch.
Terminal dilatation	$\frac{1}{50}$ — $\frac{1}{75}$ „	$\frac{1}{35}$ — $\frac{1}{50}$ „
Air-sacs	$\frac{1}{80}$ — $\frac{1}{150}$ „	$\frac{1}{45}$ — $\frac{1}{85}$ „
Alcohol	$\frac{1}{150}$ — $\frac{1}{350}$ „	$\frac{1}{85}$ — $\frac{1}{250}$ „

The number of air-sacs, according to Dr. Waters, is the same throughout life; it is clear, therefore, that they must increase in size, in order that the lungs should obtain their full development. He does not believe that the air-sacs on the surface of the lung are larger than those more deeply situated; the greater apparent size of those on the surface he accounts for by their becoming less collapsed during the process of desiccation than those which are subjected to greater pressure. This chapter concludes with useful details of various modes of preparing specimens of the lungs for examination.

We have not ourselves made any special study of the textural anatomy of the lung, and therefore scarcely feel justified in criticising the opinions of one who has gone so thoroughly into the matter. We may, however, take this opportunity to describe a mode of preparing specimens of lung which has the advantage of being very simple, of leaving the parts in their natural position, and which certainly displays very well some points of the arrangements. A thin lobule of the lung of some small animal, as a cat or dog, is moderately inflated, laid upon a slip of glass, and allowed to dry. When quite dry, it is sliced with a sharp razor, so as to expose the course of the principal air-tube, and then immersed in camphine. This fluid gradually penetrates all the cavities, and expels the air, so that the tissue becomes beautifully transparent, and very suitable for examination with a moderate magnifying power. The minute bronchi can be readily distinguished and traced to their terminations in the secreting cavities that surround and overlay them on every side. The wall of the minute bronchial tube presents numerous orifices, which evidently belong to ramifications going off from it; in the intervals of these it is in contact with the air-cells or air-sacs, which, like the ultimate cavities of a salivary gland, cluster around on every side, filling up all the interspaces. The exact mode of disposition of the air-cells and of their communication with the bronchial tube is difficult to ascertain positively; but it appears as if the tube gradually lost itself in passing on into and expanding into the aërating cavities. We are disposed to think that the arrangement figured at p. 136 of the author's work is in the main correct; that, in fact, the air-sacs communicate by groups with the bronchial tube about its terminal point. It seems clear, from the comparatively small number of bronchial tubes, that the air-sacs must ramify themselves to some extent, as Dr. Waters states. We are also inclined to believe that they enlarge as they proceed peripherally. To our mind the diagrammatic representation given by Kölliker, of two lobules of the human lung,* comes as near as possible to the truth. At least, it seems doubtful whether it is worth while to dispute much about small modifications, which remind us of tweedledum and tweedle-dee.

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* See fig. 214, Cyclopædia of Anatomy and Physiology, art., Organs of Respiration.

Chapter VII. gives a very full and good account of the bloodvessels of the lungs, the pulmonary capillary plexus, the distribution of the bronchial arteries and veins, and their mode of communication with the pulmonary vessels. With regard to the latter subject, the author, before detailing his own opinions, gives at some length those of Rossignol, Adriani, Heale, Williams, and Kölliker. The bronchial arteries he describes as forming a superficial plexus for the mucous membrane, and a deep for the subjacent parts of the tubes; they also supply the coats of the bloodvessels, the areolar tissue, and lymphatics. In the human lung it is not possible to inject completely the vessels of the extreme bronchial tubes; but this can be easily effected in the sheep, calf, and pig. The reason of this appears to be that the capillaries of the mucous membrane are exceedingly small, while those of the aërating plexus are more capacious, and very readily allow the injected fluid to pass through them into the veins; "and a route being once established the fluid is diverted from its course to the mucous membrane," and only fills its vessels in part. The blood returned from the capillaries of the bronchial artery passes back not by bronchial veins, but by the pulmonary. Occasionally the vessels passing from the outer surface of the bronchial tubes form a small trunk, which terminates in a pulmonary vein. With regard to the bronchial veins, Dr. Waters, from independent and separate inquiry, has arrived at the same result as Reiseissen—viz., that there are no vessels corresponding to the arteries, but that only some small veins at the posterior part of the root of each lung return the blood from the adjacent structure, and not from the interior of the organ. The author seems to have examined carefully the distribution of the pulmonary nerves; he has traced them in animals nearly to the extremity of the tubes, but he does not agree with M. Sappey that they are exclusively distributed to them. Some branches reach the superficial portions of the lungs.

Chapter X. gives an interesting account of the condition of the lungs in the fœtus. The following passage, we think, represents the author's views fairly:

> "If we take a fœtal lung, and follow out the course of one of its bronchial tubes, we find that the smaller branches of the tube have connected with them clusters of little pyriform, red-coloured bodies, which look very much like a number of small grapes attached to their stalks. In a fœtus of six months I have found it somewhat difficult to separate each individual body; but in a full-grown fœtus there is no difficulty in doing so. Each little body is found attached to a short pedicle. If air be blown down a bronchial tube leading to the bodies which have been exposed, the latter become distended, thus demonstrating their communication with the former. The little bodies above described are the ready-formed groups of air-sacs; the pedicle with which each is connected is the terminal bronchial twig, and the clusters spoken of constitute the different lobules."

The section which discusses the development of the lungs contains scarce anything original. In now taking our leave of Dr. Waters, we cannot forbear thanking him for his faithfully laborious and excellent essay, and expressing our hope that we shall meet him again in like fields of labour, which he has shown so much aptitude to cultivate successfully.

REVIEW III.

1. *Cornwall: its Mines and Miners. With Sketches of Scenery. Designed as a popular Introduction to Metallic Mines.—London,* 1855.
2. *Parliamentary Report on the Northumberland and Durham Collieries; in Reports of the Children's Employment Commission,* 1841.
3. *Statistical Investigation into the Mortality of the Miners in the district of Ledant.* By RICHARD Q. COUCH, M.R.C.S.—1859.

PERHAPS there is no class of our vast working population so generally excluded from the knowledge and sympathies of the British public, as the miners engaged in the collieries and metallic mines of our own country. This is the more to be lamented when we reflect that Britain, and principally England, is the greatest mining country in the world. If we assume the entire annual coal produce of the chief coal fields in the world to be 100,000,000 tons, which is rather under the result arrived at by a capable calculator, then we ourselves contribute more than three-fifths of this total; and the estimated money value of our annual coal produce is no less than *sixteen millions and a quarter,* and that not at the consumers' but at the net price. We apprehend that scarcely any of our readers are aware of the pecuniary value of this main element of our national pre-eminence. The amount of coal we actually extract every year exceeds 60,000,000 of tons. In 1858 it was 65,008,649 tons, and it has previously amounted to 68,000,000 tons for one year.

It may be instructive to attempt an illustration of this vast produce in a popular and palpable form; and for this purpose we may state that if these 68,000,000 tons were excavated from a coal mining gallery six feet high and twelve feet wide, the said gallery would be no less than 5128 miles and 1090 yards in length. Or, if instead of this enormously long tunnel, we prefer the conception of a solid globe, then the diameter of a globe containing this annual produce would be 1549·9 feet. Should a pyramidal form be chosen, then this quantity would constitute a pyramid, the square base of which would extend over 40 acres, and the height of which would be 3356·914 feet. Such is the astonishing result of the unseen and, except by the issue, unknown labour of the coal miners of our land, and such is the calculation of one of their number now, we believe, working in a coal pit at Whitehaven.[*] At first sight it may appear incredible that the supposed excavated gallery should considerably exceed in length half the diameter of our globe, and that this should be the work of only one year of subterranean industry!

The relation in which Great Britain stands to other countries in the amount and proportion of coal possessed, has been the subject of frequent, but seldom satisfactory, calculations, until the careful geological maps of recent years have enabled us to equate the superficial areas, and reliable geological sections have permitted us to estimate the thickness of the several beds of coal. We now find that Great Britain may be fairly affirmed to have 5400 square miles of coal area, the average thickness of which is about 35 feet. Our total estimated quantity of coal, therefore, amounts to 190,000,000,000 tons, while that of France is only about 59,000,000,000 tons. If we arrange three principal coal countries in the form of a ratio, we find that the amount of coal in Belgium being taken as 1, that of France is rather less than 2, and that of the British Islands rather more than 5. The number of our coal mines was 2397 in the year 1854, 2564 in the year 1855, and in the year 1858 the number was 2941. There can be little doubt that we shall soon have 3000 coal mines at work in the United Kingdom. In connexion with those now in operation, no less than 220,000 persons are employed, including males and females of all ages. Of these, in the year 1854, about 65,000 males and 1290 females were under twenty years of age. How principal an element of our mining pursuits of all kinds is constituted by our coal mining may be inferred from the fact that the whole number of our population employed in mining operations in 1854 was 303,977, so that about two-thirds of our entire working miners are in one form or other employed about coal.

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[*] The calculating collier is J. Ellwood, Moss Pit, near Whitehaven, and we take his calculation from a local newspaper. It has also been transferred into the Mining Journal, &c.

Of the 220,000 coal mining people, or say 200,000 in round numbers, labouring at this day in our own wonderful country, how many amongst our readers know aught either as to their modes of life, their habitudes, their thoughts, their homes, their calamities, diseases, and deaths? Save the medical men who professionally attend at the collieries, and the readers of a popular work entitled 'Our Coal Fields, the People in them and the Scenes around them,' we venture to affirm that there are few to whom the "short and simple annals" of the poor colliers would not be new, and in many respects surprising. In fact, until the active and arduous labours of the Children's Employment Commissioners in 1840–1, brought forth the history of subterranean life in Britain, the public at large were as ignorant of the colliers as of the Australian savages. The gentlemen who visited and descended the mines found a state of things existing there which, when it was reported upon and made notorious in the journals and periodicals of the day, occasioned the utmost astonishment to mere fire-side philanthropists, who little dreamed that the coals by which they were so comfortably warmed were in part the produce of the toils of females and young children. The principal result of this Commission was the passing of the Act 5th and 6th Victoria, cap. xcix., in August, 1842, by the provisions of which females were no longer to be employed in subterranean labour, and males were not be employed under ten years of age. Few Acts of Parliament have had more blessed results for a neglected working class than this, and although its provisions have been frequently evaded, they are now better observed and generally beneficial.

The Collieries Inspection Act was passed at a later period, yet would never have been brought forward but for the knowledge previously arrived at by the Children's Employment Commissioners. It expires in the present session, and is now in course of renewal by Parliament. Several very important representations have been made to recent Ministries, and it was thought that the present Government were disposed to take action in consequence of the statements they have received with relation to the discomforts, diseases, and high mortality of the mining population.

It is to these points that we propose principally to direct attention, both for the purpose of informing our readers upon a topic which may perhaps occupy the attention of Parliament, and which in any event should receive more notice than it has yet obtained at the hands of the medical profession.

To render these topics the more interesting and intelligible, we shall associate them with a brief description of mining life and occupations; and as the colliers are far the most numerous of our mining workpeople, we shall continue, as we have commenced, with them.

A wide difference in the physical and mental conditions of colliers *is to be* found in the various coal districts. In some places, even in England, they are amongst the most degraded of our countrymen, and it is strange that in the neighbourhood of some large manufacturing towns the colliers are notorious for bad habits and almost heathen ignorance. The same may be said of parts of South Wales and Scotland; but a partial exception to this sad state of things may be found in the north of England and in the great Newcastle collieries. The magnitude of the operations in that district has occasioned a regular and unfailing supply of trained pitmen, so that the pitmen of the north of England stand in relation to others much as regular soldiers of the army do to militiamen. Durham and Northumberland together in 1858 raised 15,853,484 tons of coal, which is nearly double the quantity raised in the same year in Yorkshire, and nearly double also of the quantity raised in Lancashire; so that Yorkshire and Lancashire united exceed but little the annual produce of the great northern coal field. The amount has nearly tripled in a quarter of a century. In all departments, too, of ingenuity and activity in the north of England the advance has been commensurate with the demand and supply of coal. Newcastle-on-Tyne has grown to a large, handsome, and populous city, out of the gains arising from the coal around it. Robert Stephenson's extensive steam-engine factory has prospered upon this foundation. Other great establishments in the same town, including Sir William Armstrong's now celebrated gun-works at Elswick, owe their locality and importance to the same basis. Vast ironworks have been established nearer to, or farther from, this carbonaceous metropolis, but all either within or upon the borders of the same abundant coal-field. Indeed, it may be doubted whether any equal space in the world, not exclusively occupied as building-ground for towns and cities, has witnessed such a rapid development of human labour and prosperity, based upon natural material resources. In the year 1773, there were only thirteen collieries on the river Tyne; in 1800 there were upwards of thirty; in 1828 there were forty-one; and now there are in Northumberland and Durham two hundred and seventy-five collieries.

Few sights of a commercial kind are more impressive than those which may be every day witnessed in this important local deposit of mineral fuel, in connexion with its excavation and shipment. The visitor is astonished to behold coal-wagons careering in successive trains over far-stretching colliery railways, leading from pit to pit in hopeless intricacy, but all having a common reference to some ultimate terminus on the river's bank or the ocean's shore. Go where you will, tall chimneys rise up before you; and here and there a low line of black sheds, flanked by engineering erections of aspiring altitude, indicates that you are approaching the centre of activity. As you draw nearer, men and boys of blackest hue pass you, and peer at you with inquiring glances. Now trains of coal wagons rush by more frequently, noises of the most discordant character increase, and you know that you are at the pit's mouth when you behold two gigantic wooden arms starting upwards, upon which are mounted the pulleys and wheels that carry the huge flat wire ropes of the shaft. For a moment the wheels do not revolve, because no load is ascending or descending; but the next minute they turn rapidly, and up comes a load of coals to the surface. Dozens of lads and men are ready to receive the subterranean freight; and away roll the little wagons containing the coal towards the huge screens that stretch along for some hundred yards or more, and upon the harsh-sounding wires of which the coals are continually shovelled. As the result of this process, the "screened Wallsend" is ready for shipment; and no sooner do the dense black clouds of coal-dust raised by the screening movement subside, than you observe other little wagons mounted on a tramway, and rushing off in a long, black, tortuous line, with a juvenile charioteer here and there sitting upon them. Should you wish to behold the final process of shipment, you must mount beside these begrimed charioteers, and then, after a mile or two, or possibly four or five miles, of bumping and thumping, of twisting round most serpentine curves, and of wild and fearful careering amidst crossing and recrossing trains bent upon like errand, you arrive at the river-terminus. Here you descend, and stand somewhat under the level of the shipping machinery. This is both ingenious in its mechanism and highly interesting in its action. It consists of a large platform of wood overhanging the river. Upon this the laden wagons, each containing fifty-three hundredweight of coals, are brought to a stand by the termination of the railway. One at a time they are placed upon a square wooden frame, which, upon the withdrawal of a bolt, is immediately moved from the fixed platform, until it is suspended over the main hatchway of the vessel beneath. A man descends with the wagon, and unfastens a latch at its bottom, which, being made to turn upon hinges, like a door, instantly opens and allows the whole of the coal to be cleanly poured into the hold of the ship. To watch the numerous coal-wagons running swiftly up to the platform, pausing for a moment, and then going slowly down upon two gigantic wooden arms, which describe a semicircle in the descent, together with the man, who moves in the same semi-orbit; to listen to the loud rush of the coals as they dash down into the hold, and to witness the uprising of the returning wagon and man, and the frequent repetition of the same process from sunrise to sunset, and sometimes during the half-illuminated darkness of the busy night, when torches glare, lanterns glimmer, and huge crates of burning coal flame out upon the surrounding gloom—is well worth a visit to the Tyne, and is calculated to leave a lasting impression upon the mind of the beholder.

Such are the scenes constantly witnessed on the surface; but what is going forward beneath? There, of course, the chief interest centres, and there are performed those deeds of hardihood which few persons care or dare to look upon with their own eyes. The writer of these pages, however, did both care and dare to see all that could be seen in the subterranean "darkness visible," and for that purpose resided some time in the neighbourhood alluded to, and descended twelve *principal* pits, selected as the choicest examples of depth and excavation. A page or two therefore may be allowed to him in order to describe what he witnessed, and to put the reader in possession of knowledge and experience which he might not desire to acquire at the risk of his own proper person.

Take any one of the largest Northern collieries, and a visit to it may serve for a visit to any or all of the others. If the reader will accompany the writer he must rise betimes in the early morning, and having obtained permission of the colliery authorities, he must array himself in a pitman's habiliments. A round, hard leather cap, a round rough jacket, coarse nether garments, and shoes to match, together with a pound of small pit-candles attached to a button-hole, a piece of moist clay for a candlestick, and a stout stick for a support, will complete his equipment. A courageous heart and a bold mien are very desirable qualifications as we approach the pit's mouth. It yawns beneath us for a thousand, or, it may be, twelve or fourteen hundred feet perpendicular. The *premier pas* has daunted many a civilian who has proposed to descend, but failed in courage at the moment of embarcation upon unknown darkness. The new mode of descent by cages, which run upon guides, and so, in fact, form a vertical railway transit, takes away nearly all the actual danger; but the old mode of travelling by "corf," or a wicker basket suspended freely over the pit, still remains in many collieries, particularly in other and less developed districts. To step from firm earth into a swinging, dusky, and frail-looking basket has been our frequent fate, and is the only mode of courting risk and excitement. The embarcation once made, a few minutes will suffice to convey us to the bottom of the shaft. Here for a minute all things are invisible; but when the eye becomes accustomed to the obscurity, slowly one object after another begins to assume shape and semblance. A dull oil-lamp throws a flickering light upon three or four pitmen who pause to gaze at the stranger, a number of coal-wagons stand ready for an upward journey, and a pony begins to neigh, having been unloosed from his unwelcome harness and load of coals. Arrangements are now made for an exploration of the interior. A lighted candle is fixed in the clay candlestick, and that again between two fingers. Davy-lamps are dealt out for remote quarters, and the procession of adventurers is formed in single file, headed by the agent or officer of the mine who has charge of the visitors.

The marching order having been pronounced, away we go into the darkness before us, proceeding for a considerable time through the mainway of the pit—its Regent-street or Cheapside. The passage through this is facile, as it is sufficiently lofty and wide enough for any specimen of humanity. It closely resembles a railway tunnel, except that no round light-hole appears at the end. The men who made these mining mainways were the first and earliest capable makers of railway tunnels. A light does soon appear far before us, but like a glimmering star rather than fair and full daylight. This continually becomes larger and more lustrous. Sounds of a joyous character are now heard, and in a few minutes the origin of the star and the sounds are discovered in the shape of a pit-lad having a candle mounted upon his cap, and singing a merry song to express the music in his soul. He sits enthroned upon a coal-train; he directs and drives a laborious pony; he pauses in his song as he nears us, and allows us room to pass him as he hastens by us with his clattering wagons. We follow the tramway, and soon behold another star, hear another song, and pass another pony-driver, and learn upon inquiry that these lads form the first distinct class of the subterranean population that visitors meet with. They are the postboys of the pit.

We might proceed for miles along this main line and meet continual trains of a like character. Being the main street, or trunk line, it receives all the coal destined for market. But it will be as well soon to diverge into a side street, numbers of which branch off from the main line, and all of which directly or indirectly terminate in it at one end, while the other end may reach far into the distant recesses. By afterwards tracing our journey upon the colliery map or plan, we shall discern that crooked as our course may now seem, it has been as direct as the excavations admitted, and that we shall have simply walked a part of the way down the principal street and then turned off into lanes and alleys the clue whereof is only in the possession of the experienced familiars of the mine. And we shall further find that the whole mine has been excavated according to a regular design, which has issued in its becoming as like some continental towns as possible in the regularity of its streets, their parallelism, and their narrowness. The whole has been wrought out like a system of panel-work, huge pillars of coal having been left to uphold the roof, and the passages having been planned to cross each other as nearly at right angles and equal intervals as the uncertain strata would permit. Like lanes and alleys, too, the side passages are far less wide and lofty than the main way, and to pass through some of them is a painful process to all but little men, and to all who cannot double themselves up like certain modern perambulators for children. Indeed, we ourselves some years ago were wheeled in an extemporized perambulator through some of the narrowest passages of the famous Monkswearmouth pit, near Sunderland, at a perpendicular depth of some seventeen hundred feet! The roof and floor were too nearly proximate for a tall man, and only by extending ourselves horizontally on a kind of truck, which was wheeled along by the benevolent superintendent, did we escape decapitation or a battered skull.

Having diverged to some distance in one of the principal side passages named by the workmen *boards*, we soon come into contact with a very rough, hardy, and wild-looking race of lads and young men, who are called *putters*, from their employment in *putting* or pushing the loaded coal-baskets along the rude tramways. Subdivisions of this kind of labour are made in accordance with the ages of the lads and their relative strength and capabilities for their work. To witness the combined pushing, pulling, and dragging action called forth in conveying a load of baskets along these narrow ways is indeed painful, and it was in work of this nature that even girls and young women were formerly employed, though not in the northern coal-field. We never witnessed any sort of work so unquestionably exhausting for young persons as this, especially when the confined place and the impure atmosphere are taken into the account. The average earnings of the respective orders of these young persons are for the oldest lads, 3*s.* to 3*s.* 6*d.*; for "trams," 2*s.* 6*d.*; for "headsmen," 2*s.* 2*d.*; for "half-marrows," 1*s.* 10*d.*; and for "foals," 1*s.* 6*d.* per diem. The drivers before-mentioned obtain 1*s.* 3*d.* per diem.

Beyond these various orders of the "putting" class, we advance as we best can by a combination of motions, consisting of creeping, wriggling, and stepping out, into what may be regarded as one of the inner cells of the mine. To this place the chief workmen of the pit, named the *hewers*, make their way at two or three o'clock, or possibly four o'clock every morning of a working day, and here they labour for eight hours in general, or in some instances an hour less or more, according to their own disposition, for they are paid by the amount of coals sent up to the surface. This work is perhaps as peculiar and severe as any in England, if not severer than any other. The pick and spade are the hewer's only tools, and the former is wielded under considerable disadvantages. To hew coal well and economically is a difficult task, and difficult in inverse proportion to the thickness of the seam of coal. In thick seams, as in Staffordshire, it is mere amount of strength that is demanded, but in the thinner yet more valuable seams of the North of England, which may be from one to three feet in thickness, the duty is severe indeed. First there is the necessarily confined position, for the seam being thin, the roof is low, and the space for using the arms very little. Hence you see one hewer kneeling, another squatting, another stooping or bending double, and in some cases you may see men lying on one side or on their backs, and in all these positions hammering at the coal above or before them with their short but sharp and heavy picks. You may well be prepared to hear these men singing doggrel somewhat like the following:

"Was there ever so slaving and slashing a trade,
Such a trade as this horrible hewing?
I wish I'd been bred to the plough or the spade,
To building, or baking, or brewing!"

The position of the hewer being one of such painful constraint, it may be inferred that the occupation requires long practice in order to insure proficiency in *cutting* the coal, to use their own phrase. It is therefore entered upon at an early age—seldom later than twenty—and a fit preparation for it is found in the other kinds of pit labour undertaken by lads and young persons, particularly the putting. Although the hours of labour are not long, and although the hewers have half the day to themselves, yet the effects of position are seen in their peculiar configuration of body, which appears in many instances to be hereditary, for there is nothing to account for it in the previous labours of pit life.

No one who has familiarized himself with this class of men can fail to distinguish a genuine born and bred hewer out of a hundred men in Newcastle streets. His stature is diminutive and his figure disproportionate and somewhat misshapen; his legs are more or less bowed, his chest protrudes, and the thoracic region is unequally developed; his arms are long and oddly suspended; his countenance is not less peculiar than his figure, his cheeks being generally hollow, his cheekbones high, his forehead low and retreating, his brow overhanging, and his gait remarkable. As he walks in the open air, he walks as if underground. His body is adapted to narrow passages, and he appears, even under the lofty dome of heaven, to be but a mere walking note of interrogation. You may meet a jolly blacksmith or engineer in the workshop of the mine, but you will never meet with a jolly pitman. He has been in the bowels of the earth, he has seen further and deeper into things than other men, he has mused in darkness, and dwelt long in the depths, and as a consequence has returned to the ordinary level a sadder and a wiser man than his fellows.

Let us more minutely inquire into the effect of the various deleterious agencies which operate upon the habitual coal miner. He is deprived of the beneficial rays of sunlight for a considerable portion of his time, partly so in summer, and nearly entirely in winter. In the case of the other classes than the hewers, and those who work about ten or twelve hours a day in the pit, they may be said almost to live in darkness. Some little boys have complained to us personally that they seldom saw the sun except on Sundays and holidays. It is not so much with respect to the hewers, as the other workpeople that this complaint is made, but the marked paleness or *sodden* aspect of pitmen's faces manifests the effect of deprivation of light, and seems to be nearly equivalent to the etiolation of a plant deprived of light. For this amongst other reasons, most of the Belgian mining engineers are of opinion that nightwork in their mines is preferable to daywork, and that it does not present serious difficulties in the employment of the young miners.

The next and most important of all hygienic topics in relation to ordinary pit life is the atmosphere of the mine. It is manifest that to convey fresh air to the different quarters of the mine where human beings are at work is essential to their existence and health. General readers are not aware of the large amount of inquiry and discussion which has had reference to the efficient ventilation of coal mines, nor can we do more than briefly glance at the prominent points. Certain it is that artificial ventilation must be afforded in all extensive mines, and certain it is that the expenses and care attendant upon a good system of such ventilation are obstacles to its adoption in too many cases. Natural ventilation will not meet the demand, although all artificial ventilation must be founded upon the principles of the natural. The problem to be solved is this:—There are from three to five hundred human beings down a coal pit, distributed in various passages and corners, some nearer and others remoter, and some one, two, or three miles away from the place of entrance. Every one of these, wheresoever placed, must be reached by a current of fresh air for breathing at the rate of 1000 cubic feet per hour per man at the minimum. But many mines abound in noxious gases, and most mines are troubled with them to a greater or less degree. Fire damp, as we shall presently explain, sometimes exudes and "fouls" a Northern coal mine in a few minutes. Air also will be needed to disperse perspiration from the men at work, to answer the combustion of candles, and to meet the requirements of horses and ponies underground. Add the requisite quantities for these demands together, and all things being adjusted, you find that not less than 500 cubic feet per man *per minute* are essential. But if you wish a general rule, you must suppose that for sanitary purposes you have to provide not less than 250 cubic feet of air per man or boy per minute in every mine. It follows that in most large mines, a continual current of not less than from 30,000 to 50,000 cubic feet of air per minute should descend the shaft and circulate through all the passages, arriving at the "face of the workings," and sweeping away with its airy fannings all the quickly accumulating impurities of the whole pit.* In cases of very gaseous seams of coal, the circulating current should be, and generally is, even larger than this; and in the instance of the great Hetton colliery, which supplies much of the best coal sold in the London and other markets, the circulating current of air permeating the extensive workings equals the large amount, as we were informed, of 168,000 cubic feet per minute, at a velocity of 18·3 feet per second. The tube of air is two miles and a half long, and the average area of the passages 864 feet. The area of the "upcast shaft" is 153 feet; and its depth about 900 feet.

How to convey this or any similar body of air through all the intricate passages of a mine has been the great practical problem for more than half a century in the North. At first the ventilation was very insufficient, and doubtless many poor fellows then lived out but half their days. We know from old pitmen that the air current was wretchedly poor, languid, and impure in their early days, and so it is at this time in many of the less important coal districts. The difficulty lies in compelling the air current to perform an unwelcome duty. Naturally it would be an express traveller, rushing from shaft to shaft, from entrance to exit, with not a yard of deviation; but in so rushing along the mainway of the pit, it would leave the larger portions of the workpeople entirely unvisited. It must therefore be compelled to pursue precisely the course of a mining inspector, and permeate the entire inhabited part of the mine, just as a human being would perambulate it. This can only be thoroughly effected by causing an expansion of the air by heat, according to the well-known rule that 100 parts of air, taken at the temperature of 32° Fahrenheit, when heated to 212°, will expand into 137·5 parts, which gives an expansion of $\frac{1}{480}$th for every degree of temperature. The motive power is the difference between the temperatures of the two columns of air in the two shafts of the pit (or the two portions of a divided single shaft), occasioned by the application of heat at the bottom of the exit or upcast shaft or division. The temperature of the entering or downcast shaft of Hetton colliery is 60° average; that of the "upcast" or exit shaft, 140° average. The difference, 80°, is the motive power. But to prevent the too speedy and powerful action of such power, and to secure the entire permeation of the mine, a system of simple mechanical contrivances is adopted, and these act as hindrances to the rapid escape of the air. They consist of "stoppings" of brick or stone and wood; so placed that the air current is forced to turn and twist as the miner wishes, and, in some instances, to perform the most complex and apparently unnatural movements. We have seen it made to split into two currents, turn back upon its course, and even accomplish a somersault upon itself—by stoppings so placed as to leave it no other course. The most important discovery of all was the method of "splitting" the air, so that one main current, after doing its first work in the whole, is, by a wooden or other erection in the length of a pit passage, divided into two currents, one of which goes to the right, and the other to the left hand. Thus, one "split" may go up the left-hand division of the gallery, and return down the right-hand division, half the entire current having executed double work, while at the same time the other split has been performing a similar course in the adjoining gallery. There are, in the Hetton colliery, no less than sixteen splittings of the air, each fifty-four feet area, and equalling 864 superficial feet aggregate area. The average length of each split is two and a half miles. This is literally a subdivision of aerial labour, and the counterpart of modern political economy in underground aero-dynamics.

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* The above figures are those on which we can rely; but the widest variations exist in the opinions of miners as to the minimum amount of ventilation. Many would be satisfied with much less amounts than we have given, and which represent the views of the most judicious officers of mines.

In such an immense colliery as the Great Hetton, the air would have to travel seventy miles from entrance to exit, and to pass through areas of passages which we reckon to average fifty-four square feet. There must be a powerful impulsive force to propel or draw along the continual current. The mere natural "drag" of the ascending or "upcast" shaft against the descending or downcast shaft would effect but little, and in such a case almost nothing. The requisite compelling force is supplied by the action of a huge furnace kindled at the bottom of the upcast shaft, and rarefying the air in that shaft to such a degree as to create a most powerful draught, and thus operate like an enormous chimney in connexion with the whole mine. This furnace fulfils the most important requisites in motive power by its efficiency, its uniform action, and the easy control of which it admits. The consumption of coal in each furnace is immense, and the result proportionate; the very largest collieries require these furnaces to be constantly kept in intense combustion. There are three such furnaces at the great Hetton colliery, and eight tons of coal are consumed by them in twenty-four hours.

These can drag along, if put to their full power, an air current amounting to 200,000 cubic feet of air per minute, which is equal to a cube of air of which each side measures sixty feet in length. In this immense underground excavation, which almost rivals a town in the number of its streets, and turns, and living inhabitants, amounting when in full work to probably about 1000 persons, the air appeared to us to be perfectly adequate to all requirements, except, possibly, extraordinary escapes of fire-damp; nor did we find any part of the pit more offensive and impure in its atmosphere than might have been expected from the depth and the natural increase of temperature.

In this instance we have referred to one of the largest, if not *the* largest and most productive coal mine in the world. Its system of ventilation is the most perfect yet devised, and the most efficient that the experience of the Newcastle colliery managers can compass. It has indeed a particularly well-planned system of "splits," by means of which it has been found that even by natural ventilation alone on a winter's day (that is, without the aid of the furnace), a considerable body of air comes through the mine. By providing a separate split or current for ventilating each range of workings, the air is brought much cooler and purer to the miners; and this is what should be accomplished in every case. In well-constructed furnaces, the consumption of one ton of coal a day will raise 60,000 cubic feet of air per minute 30° in temperature, which is sufficient to produce the necessary motive power for ventilation in all mines not containing fire-damp. An additional ton per day would be generally enough to purge the mine of any ordinary amount of fire-damp. The inexcusableness of not adopting such easy ventilation is manifest when we state that the cost when the furnace is kindled will not exceed one penny per man per day, and that in mines where there is no inflammable gas, the cost would not much exceed one halfpenny. It must be noticed that the small coal which might be used in the furnace is commonly thrown away as unfit for market, and unsaleable.

When the Newcastle system has worked so well, is so simple in its principle, and so readily to be studied in its operation; and when it can be so easily adapted to other mining systems, it seems impossible to attribute inefficient ventilation in several districts to any other cause than culpable indifference. One would scarcely feel disposed to set it down to a paltry parsimony, since the cost is so small; yet we have reason to believe from what has been disclosed at coroners' inquests, and by careful inspectors of mines, that the overlookers or superintendents of many of our mines are equally indifferent and parsimonious. Very generally ignorance or indifference prevails as to the simple splitting of the air-current. Uneducated managers seem not to know its advantages, both in efficiency and economy. To double their ventilations, they would send down a double quantity of air in one current, in ignorance of the fact that to double the ventilation requires at least eight times the power, while if two currents of air pervade the mine instead of one, the power required is little more than double—that is, in the expression of technical language, the power required to ventilate a mine increases in a higher ratio than the cube of the amount of ventilation. Again, incompetent stewards of collieries care little about the rate of circulation, being indifferent to such facts as these—that the men respire more freely in pits having a rapid circulation, that the roadways are kept drier and more easily repaired, that the timber employed in propping up the roof lasts longer by many years, and that economy in money, and human health, and labour is secured by a sufficiently rapid air circulation. In some coal pits the air can scarcely be seen to move at all, and a thick mist clouds the entire pit, this being occasioned partly by fermentation in the wastes and old workings, partly by the lights, and partly by the heat and effluvia escaping from the horses and men. Add to this a large proportion of carbonic acid gas, perhaps some fire-damp or light carburetted hydrogen gas, and you find an atmosphere which none but colliers could endure, and which any medical man in the kingdom, if impartial, would pronounce to be highly deleterious and gradually destructive of the most robust health. A eudiometer would show marvels of mischief.

The economy of efficient ventilation, merely as a question of money, might be presumed to be a sufficient persuasion to its adoption. The saving of timber, for instance, from improved ventilation, is estimated as high as eighty per cent. The proprietor of one colliery confessed that he had reduced the expense of timber in the first year of trial from 6*d*. to 4½*d*. on every ton of coal extracted. On the score of human life and health, a much stronger appeal might be made on moral and philanthropic grounds. We have conversed at length on several occasions with a recently deceased and most intelligent inspector of coal mines—Mr. Mackworth—upon the actual condition and possible amelioration of the collieries in Somersetshire, Gloucestershire, and South Wales, and that gentleman assured us that they were so very far behind the collieries we ourselves had inspected in the North of England, that we could form a very inadequate conception of the scale of the one from that of the other. "I have frequently met," said Mr. Mackworth, "with instances where the men were obliged to work in the dark from want of ventilation, some being pointed out to me who were particularly good hands at it; and I have had occasion to spend the night in parts of mines where the candles will only keep alight by being tied two or three together and laid horizontally. A few months ago, the manager of a colliery was killed by remaining ten minutes in a place where the men had at last refused to work. The exclusive attention of the miners is directed to keeping the candle burning—a very necessary caution, for in passing slowly through the air in roadways my candle has sometimes gone out ten or twenty times; and I have seldom visited mines not containing explosive gases where there was sufficient oxygen to keep a light burning throughout the parts in work. These, then, are the ordinary limits within which a miner has not only to live, but to carry on a laborious occupation." Again, "I have met with many instances where a light will burn at the feet, and go out if raised up to the head, or it will go out only in the highest parts of the works. In other instances, carbonic acid gas, air, and fire-damp, may be found in successive strata at the same spot. It must be recollected that a miner works in the lowest possible room, in such conditions as would be felt by a person confined in the upper part of a close room in which many persons are congregated, and in addition, the miner is at a great distance from the atmosphere."

An observation made by Dr. Hanot is worth citation. "Placed," says he, "in favourable circumstances for observing two kinds of working miners in two distinct kinds of coal mines—the colliers of Durham, where the ventilation is good, and those of a foreign field, where it is slow and often neglected—I have arrived at the conviction that there existed among them an external difference physically, readily appreciated by the eye, to such a degree that I could point by the finger, when surrounded by workmen, to those who work at one or at the other description of mine."

In the recesses where the hewers or getters of the coal are at work, not only is imperfect ventilation most imperfect, but what air there is will be more heavily loaded with impurities than at places nearer the shaft. Yet these men who have the worst air of all the men, most need the best, as they work the hardest and perspire most copiously. Frequently they employ gunpowder to blast the coal and detach it from the seam, and then they have an additional impurity in the smoke that hangs about their cell for a long time after every blasting, in many instances for half an hour after the firing of each shot. During this time even candles burn very dimly, and the men are compelled to pause and trim them, while the quantity of small coal dust continually floating in the air of these coal cells is largely increased. After having respired an atmosphere so loaded (and these were not the worst cases) for five or ten minutes, we ourselves have been compelled to retire towards the main head-way to recover from nausea and oppression. One hour of such inhalation would seriously indispose any but a born and bred pitman. According to one estimate, two miners, working for an eight hours' shift or change, give off—

By breathing . . .	1·53lbs.	carbonic acid gas.
From oil lamps . . .	1·03lbs.	" "
From blasting . . .	·56lbs.	" "

Carbonic oxide and compounds of hydrogen gas are also produced by blasting. The solid particles of combinations of potassium float in the air and cause smoke, which should be at once removed by the air-current. Here, too, we may name the sulphuretted hydrogen which abounds in some mines, though not often in the Newcastle coal pits. It proceeds from some mineral combination, and from the excrementitious rubbish which necessarily accumulates in the corners of the working places of the pit. Its influence on the respiratory functions is extremely injurious, and it would seem to act upon the blood by depriving it of some of the elements necessary for proper respiration. A small proportion, even one in fifteen thousand, is supposed to affect the constitution, while $\frac{1}{1500}$th has been known to kill a bird, and $\frac{1}{250}$th killed a horse. A medical record exists of its injurious effects in some Belgian mines, and it is known amongst our own mines under the popular name of *white-damp*, although very little attention has been paid to it.

The putrid fermentation of animal and vegetable matter underground gives rise to a variety of exhalations and miasmata which act most injuriously. The warm and rather moist atmosphere of the pit favours their production and their destructive diffusion. Any Inspector of Nuisances above ground would find his calling doubly necessary below, and such an officer could decide what would be the effect of the ever-accumulating heaps of these disagreeable matters, which the daily necessities of masses of men and boys amounting to three, four, and five hundred in number occasion. Above ground the winds of heaven are always at work to purge our nuisances, but let any one conceive what the state of things must be where the winds are strangers or stragglers, and where, in place of winging their free way with vigorous impulse, they are compelled to "drag their slow length along" like an Alexandrine line in verse. Yet there are no means and no inspectors specially appointed for the removal of these nuisances. The decay of the vast number of props which are employed to uphold the roofs of most mines, and particularly of the metallic mines, must greatly add to this evil.

Inhalation of the coal dust, which is held in. mechanical suspension as before stated, is productive of melanosis and other similar affections. When the "black spit" of the pitman is examined under the microscope, it is seen to consist of mucus, enclosing finely divided particles of coal. The "black-lung" of the patient is a natural consequence of continual inhalation of coal dust. The pathological condition of some colliers, at a post-mortem examination, has been described by Mr. W. T. Cox, who states that the black treacly fluid obtained in each case by cutting the various portions of the lung and by slitting up the bronchial tubes, was evaporated to dryness; even the residuum, upon being broken up and subjected to a red heat in a porcelain tube retort, behaved precisely like coal under similar circumstances, evolving a smoke-like, gaseous product, which, upon being slightly condensed, deposited hydrosulphite of ammonium and coal-tar. Being then purified, in all respects it burnt like the well-known compounds of the two carbides of hydrogen (common gas). The same conclusion as to the carbonaceous nature of the deposit, was arrived at many years since by Dr. Gregory, of Edinburgh.[*] Add to the presence of this foreign body in the lungs the several deleterious actions previously noticed, and the result, however lamentable, will not appear wonderful, when we state that the aggregate amount of sickness experienced by miners during the period of life between twenty to sixty, is *ninety-five weeks, or sixty-seven per cent. beyond the average of others.*

The forms of disease are asthma, bronchitis, and pneumonia, to which should be added rheumatism, not, indeed, an unusual or very important affection in itself, but leading in rheumatic fever to heart-disease. The particulars of the ages of the sick are instructive. At age twenty, miners experience an average amount of sickness of 46 per cent. more than the general class ; at forty years, 78 per cent. ; at fifty years, 76 per cent. ; and at sixty years, 53 per cent. This is the summary of Mr. Ratcliffe's tables, but even these scarcely show the full amount, for had the lives of the miners, which form 4·93 per cent. of the general class, been first extracted therefrom, instead of standing with them in the reckoning of the whole, then there would have been a less average amount of sickness attributed to the general class, and, by so much, a greater amount to the miners. Furthermore, these tables do not include lives under eighteen, before which age not only disease but extensive mortality occurs. It would therefore not be too much to infer, that the average sickness of miners amounts to *seventy per cent.* in excess of the general average, a result for which we apprehend very few of our readers are prepared.

Let us now institute a comparison between the metallic miners and colliers, noting the differences arising out of the different methods of working coal and metallic mines. We have only to follow the rivers Tyne and Wear up towards their sources in the hilly country, in order to meet with a vast development of lead mining. Indeed, the most extensive mineral property in England, in the hands of one individual, is found in the mines of East and West Allendale and Weardale, lying in Durham and Northumberland, and forming the property of Mr. Blackett Beaumont, M.P. for the latter county. In the year 1854, the produce of these mines was 12,220 tons of lead ore, which yielded 9200 tons of lead, and 49,000 ounces of silver. The entire produce of the lead mines of the two counties is 22,329 tons of lead ore, yielding 16,669 tons of lead, and 78,577 ounces of silver—chiefly separated by Pattinson's scientific and singular process. The adjoining county of Cumberland afforded, the same year (1854), 9890 tons of lead ore, or 6662 tons of lead, with 42,020 ounces of silver. To this total Westmoreland adds a small portion. These associated counties yield a large proportion of the entire lead produce of Britain, which in 1854 was 90,553 tons of ore, or 64,005 tons of pure lead. The number of persons employed in our entire lead mines was 21,749, inclusive of men and women of all ages. Of these 16,441 males were twenty years of age and upwards, and 4937 males under twenty years of age; out of the whole 21,749 persons, Durham employed 28,265, Northumberland, 10,536, and Cumberland, 3579.

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[*] There is no sufficient ground for supposing that this blackness is not purely of extraneous origin, or that it may be generated in the lungs themselves, or in or by the bronchial glands. It appears also amongst the Cornish miners, and is indeed one of the most frequent evils brought to notice by Mr. Couch and others who have examined them in relation to disease. The early history of the dark sputa is much alike in all cases, the chief variation being in the period of its commencement. All persons placed under the same circumstances give the same result, though the expectoration may be darker in one than in another. The opinion of Mr. Couch, surgeon, of Penzance, is thus expressed: "From all that I have witnessed in mines in general, and from twelve hundred cases that I have particularly examined, I am convinced that the whole of the discoloration arises from external causes. The chief of these are, the breathing of smoke of the powder in blasting rocks, candle-smoke greatly increased from air deficient of oxygen, and smoke from fires; or, in a few words, carbon in minute division from any source will produce it. I have found black sputa in engine-drivers as well as in their assistants, in smiths, and other persons who work under similar circumstances." Again: "Its intensity is in direct proportion to the exposure of the men (in mines) to smoke, and to their removal from good air. It is not found in any of the men or boys engaged at the surface in the open air during the day."

Of this large number of persons in the three counties, all that has been learnt in relation to vital statistics has resulted from private research. We visited several of these lead mines for the purpose of inquiry, and were mortified to find that nothing had been tabulated. Only a vague feeling of the pestiferous nature of the occupation existed, and the local registers were not kept with distinctness as to classes. Subsequent research, however, has been made by Dr. Greenhow and others, and comparisons instituted between the death rates of the men and women of Reeth and Alston, which are exclusively lead-mining districts. It appears that the lead miners perish at the rate of 2037 out of 100,000 of all ages; whilst their wives and sisters and daughters, who are variously employed, die at the less rapid rate of 1711 out of 100,000—that is, lead-mining occasions an excess of mortality equalling 326 deaths in every 100,000 persons. Pulmonary disease is the most prevalent and fatal consequence of lead-mining in the interior of the mines, so much so, that the difference between the two sexes above the age of twenty is found to be a *double death-rate* in the males compared with the females! This, probably, is the worst known issue of mining disease. Though things are bad enough in Cornwall, yet *in comparison* they are somewhat better—as in Redruth, a copper mining district, 220 males out of 100,000 die from pulmonary disease in excess of the females; while in another place, in the midst of a tin-mining district, the death of males is in excess of that of females by 104.[*] It should be remembered that in the lead mines and other metallic mines the large numbers who are employed at the surface in breaking or "dressing" the ores are comparatively healthy, and that the effect of a change from the interior to the outside of the mine is equivalent to going "out of town" amongst ourselves.

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[*] Such is the result of one inquiry, but we have just learned from Mr. Couch that "during the last five years deaths from thoracic affections among miners have been *more than double* those occurring amongst females during the same period (in the district of Lelant, Cornwall), with an addition also of five years to increase the results, and that among the male population they are also nearly double under the same circumstances; the average deaths among miners from chest diseases being 68·15 per cent.; among other males 38·69 per cent.; and among females 31·72 per cent." It is worthy of note that "the increase and decrease of the number of deaths from pulmonary affections in miners is generally accompanied by a similar increase and decrease among the general population, though the general result bears the same unfavourable evidence of the great mortality of the miner over any other class."

If we now continue at the other end of our country, and proceed towards the Land's End, we enter a district as much devoted to, and supported by, copper and tin, as the northern counties are by coal and lead. Every tradesman in the latter parts can talk to you about coal; every tradesman in the former is, in like manner, interested in copper. Your ideas, your phrases, your inquiries, must correspond with your change of locality. In both places you are in the heart of mining business and mining population; but the contrasts between them are as striking in respect of superterrestrial sights and scenes, as of subterranean excavations and labourers.

The simplest method of conveying a rude conception of the workings of a coal mine is to say that it resembles a horizontal course of masonry; and of a copper or tin mine, that it resembles the same course of masonry placed vertically. The coal mine is comparable to a regular stone pavement, the copper mine to a regular stone wall. In the former case, the galleries of the pit are nearly all horizontal, and the portions left as pillars are the solid upholders of the roof; in the latter case the galleries are also chiefly horizontal, but they are connected by a considerable number of little vertical shafts (*winzes*), which tend to divide the whole mine into cuboids, but which do not directly communicate with the main shafts. The coal mine has but two perpendicular shafts, sometimes only one divided; but the copper mine may have, in addition to two or more shafts, a hundred winzes, which communicate vertically from gallery to gallery, and so open a hundred communications between two contiguous and parallel horizontal passages without reference to the main shafts.

This difference of excavations arises from the different course of the natural depositions of coal and copper and tin. Coal lies in nearly horizontal or slightly inclined *seams*, when regarded in its normal condition, and when not upheaved or geologically deranged. Copper, tin, and most metals are contained in lengthened, uncertain, but generally highly inclined veins (*lodes* is the Cornish term), which descend in a line not deviating from the perpendicular by 45 degrees, and which have a somewhat determinate bearing when viewed altogether in one district, but a very indeterminate one when regarded separately. Hence a Cornish mine is so worked as to *cut* the lode as conveniently as possible by subdivisions in successive *levels* (as the horizontal passages are termed) and successive *winzes* (as the smaller vertical communications are named). These subdivisional cuboids are not precisely regular, but as nearly so as the course of the lodes will permit. Any extent of workings can thus be carried forward, and the rate of progress depends ultimately upon the prosperity of the concern. That most wonderfully successful metallic mine of modern days, the Devon Great Consols, may be taken as an example. In 1850, when it had been at work only five years, there were 5853 fathoms, or nearly seven miles, of excavations, horizontal and vertical. About one thousand persons were engaged, and consumed in their operations above 3000 lbs. of gunpowder and 400 dozen lbs. of candles every month. The extent of excavations in one of the largest and most celebrated Cornish mines, viz., the Consolidated Mines, near Redruth, is astonishing, when we consider the hard and resisting nature of the rock, and consequently the slow progress of mere human hand and tool work against it. A few inches of daily advance is all that can be expected in working through granite and "killas," or hard clay slate. Yet the unceasing advance of the few inches, going on simultaneously in many different levels, effects an amazing aggregate of progress in a number of years. In the period of twenty years ending June, 1838, about 37,330 fathoms had been *driven* horizontally, and about 18,000 fathoms *sunk* vertically (in shafts and winzes) in the Consolidated Mines, amounting to a total of nearly sixty-three miles ! Such is the power of indomitable perseverance, even when driving against the hardest rocks by candle-light, and that of the dimmest order. That the laborious and expensive character of this kind of work may be duly conceived of, we state that in one year (1837) the consumption of necessary articles in the whole Cornish and Devonian mines was—of coals, 58,860 tons, which, at 17*s.* per ton, cost 48,331*l.*; of candles, 1,344,000 lbs., which cost 35,000*l.*; of timber, 14,056 loads, which cost 36,545*l.*; of gunpowder, 300 tons, at the price of 13,200*l.* In the year 1843, the total amount expended in mining labour was 900,000*l.*, and the expenditure for mining materials was 300,000*l.* In 1855, the total amount of tin ore raised in Cornwall and Devon was 8947 tons, the value of which was 608,396*l.* In the same year, the amount of Cornish and Devonian copper raised was 195,193 tons of ore, yielding 12,578 tons of pure copper, and bringing in money 1,263,739*l.* Such is the pecuniary and commercial value of these great achievements of metal-mining industry.

It is necessary to premise thus much in order to heighten our interest in the human operatives who live together in and around these subterranean cells. Their number is 21,169 men and women of all ages for the entire copper mines, and 14,761 persons for our tin mines. The lead mining in Cornwall is restricted to about 2500 persons, but taking all the lead miners of the kingdom together, their number, inclusive of men and women of all ages, is 21,749 persons. Endeavouring to separate the Cornish and Devonian miners from the whole number, we find the numbers for one recent year to be as follows :—

	COPPER MINING.		TIN MINING.	
	Males.	Females.	Males.	Females.
Cornwall	15,608	3,684	12,255	1,876
Devonshire	1,185	162	583	6
	16,793	3,846	12,838	1,882

In all, then, we have in these two counties about 35,359 persons engaged in such work as practically separates them from the great mass of their fellow-countrymen, and whose labours, lives, diseases, and deaths are as little known to the public at large as those of the native New Zealanders.

The Cornish mining people are divided into several classes, which can only be cursorily described by us. If we examine their several callings in the two largest mines in Cornwall, and probably in the world—viz., the Consolidated and the United mines, we find that in one year (1836) there were no less than 3196 persons employed in and around these two mines, 2387 of which were engaged in the former establishment. Analysing this latter number, we discover it to consist of 441 "tut-workmen," or such as work by the task, and 392 "tributers," or such as work (underground) by a special arrangement called "tribute," which is a certain percentage upon the actual value of the ores raised; 335 "surface men," who work above ground; 321 surface boys, and 109 underground boys; together with 753 females, all of whom work at the surface in picking, sorting, and otherwise "dressing" the ores when raised. Twenty-eight agents or superior officers make up the entire number. In general, it may be estimated that the proportions of these classes in every hundred miners are as follows:—30 tributers, 20 tut-men, 10 surface labourers, 25 boys, and 15 labourers. The tributers, then, form the most numerous, as well as the most important class in the Cornish mines. Casting a glance over the entire population of Cornwall, we should describe it as consisting of three great classes—agriculturists, miners, and fishermen; or in other words, those who profit by the surface of the earth, those who profit by the depths of the earth, and those who profit by the depths of the ocean. Of all these we should, perhaps, pronounce that the most intelligent are the miners, and the most intelligent of these again the tributers. Frequent conversation with them upon their own ground, or rather under it, has led us to form this opinion: they certainly see deeper into things than most of their neighbours, and in calculating subterranean probabilities they are scarcely to be matched in any other country. As miners they are sought for over the mining world; but it unfortunately happens that emigration is not always amelioration, and the license of a foreign land often proves too much for the soberly brought-up and laborious tributer of the English county of copper and tin.

There is much of considerable interest connected with their daily life and labours, but we have to speak chiefly upon the causes and prevalence of disease amongst them. If we institute inquiries into the state of health of the whole Cornish people, we find them to be generally healthy, well conditioned, and well conducted, and rather more so than in similar counties. Even Camden, in his 'Britannia,' notices this fact. The entire 356,662 inhabitants, therefore, would in the mass be regarded as remarkable for health, strength, and longevity. But a decisive exception must be made with reference to less than one-seventh of this population—viz., that portion which is addicted to the mines. There is but one way in which we can ascertain the vital statistics and hygiene of the mining classes, in the absence of public and authoritative statistics. We must select specific mining districts, and note the accounts and inquiries of one or two local investigators into these matters. The parish of St. Just is composed of an elevated *plateau*, untraversed by a single valley of importance and uninterrupted by any line of hills. The bold northern and western shores are surrounded by the Atlantic, and the cold in winter is not severe. The cottages are mostly superior to those of agricultural labourers, and it is mainly a mining district, and chiefly inhabited by the dependents on the copper and tin mines. Yet taking the deaths in this district for the five years ending 1856, the melancholy result is that forty-nine in every hundred of the miners appear to have died of chest diseases, while of males who were not miners, only twenty-eight died in every hundred. Not far short of a *double mortality* in five years is indeed a sad tale to tell. Yet it is even worse when our calculation is founded, not upon the average of five years, but on that of nineteen—viz., from 1837 to 1856 inclusive; for then we see that chest diseases carried off fifty-one in every hundred of the miners; and if we exclude the deaths from accidents in the mines (to which the other males are not exposed), then the percentage for miners dying of chest disease rises to the high proportion of sixty-two in every hundred, being *considerably more than double* that of males not miners.

This respects the mortality of the miners, but another important inquiry is that taken up by a local surgeon to several mines, Mr. Couch, and which shows the *duration of ability for mining labour, compared with the age at death.* Taking the average age of the miners at death, as recorded in the public register, and the average age of the same class of men at work in the mines, the two differ widely. The deaths of miners registered in St. Just from 1837 to 1856 give an average duration of forty-seven years. Now it might be expected that the average age of the living and working miners would not so materially differ from this as to occasion doubt; especially if those who are named miners consist not merely of underground workers, engaged in severe mining labour, but also of men occupied in the far easier task of timber work. Yet it is ascertained that while the average terminal age of life in the register is forty-seven years, the average existing life of 715 miners at work in these mines is only twenty-eight years and one month, or a difference of nearly nineteen years. It is a fair though fatal inference from this latter average, that the interval between twenty-eight years of age and forty-seven is one of comparative incapacity for underground labour. If the age at death be forty-seven years, and the age at active labour be twenty-eight years, no other conclusion can be arrived at than this:—the period of manhood's prime and vigour in nearly all other occupations (except the very destructive) is the terminal period of the Cornish miner's activity. Supposing that he commenced this work at ten years, it would terminate at the age of twenty-eight, or in eighteen years. There is even a worse issue than this, for excluding the timber-men and such as only descend occasionally, then the average age of those who are strictly miners sinks to *twenty-six*, a result which we should have hesitated to publish except upon so good a local authority as that of Mr. Couch.

Yet our own conversations with miners and our observations of their habits and disadvantages might have prepared us for such an issue. A

St. Just miner informed Sir John Forbes that three out of every five miners above forty years of age have short breath and cough, and that a still larger proportion die before they are fifty or even forty. "The unanimous testimony of the whole profession in the West of Cornwall," says Sir John Forbes, "goes to establish the great comparative unhealthiness of miners, and the premature death of a great proportion of them from diseases occasioned by their mode of life."

"I have weighed," says Mr. Couch, "about 1100 men, and find they lose three pounds and three quarters, on the average, during the time they are underground; some as much as ten pounds." The same gentleman has recently made an elaborate statistical investigation into the mortality of the miners in the Cornish district of Lelant, a district widely excavated by several companies; where, however, the miners' cottages are much inferior to those in St. Just. The mortality amongst the Lelant miners is truly, as the inquirer says, "frightful." In brief, while the deaths from diseases of the chest on the average of five years ending 1841 amongst non-mining males were thirty-eight in one hundred, the chest diseases amongst mining males killed sixty-eight in the hundred!

It is to be expected that the debility and low vitality of the father will fall upon his children, and therefore the infantile and juvenile mortality in miners' families becomes an index of the sickness and disease amongst the fathers. Accordingly, if we pursue this inquiry in St. Just, we learn that the offspring of miners is comparatively feeble and degenerate. This is very noteworthy, as they are born in an open and salubrious country; and the children of agricultural parents in the same district are healthy, and, like their fathers, stout and ruddy. Just as the mining fathers have a bloodless and unhealthy appearance—are spare, infirm, and scrofulous in aspect—so in their degree are the children. As the Cornish children are not employed below ground at an early age, none of the evil can be attributed to occupation. Yet in the register the number of early deaths of which "debility" is assigned as the cause is astonishing. The extraordinary high proportion of deaths is fifty-five per cent. under five years of age; and this not for a single year, but on the average of sixteen years.

> "A large proportion," remarks the investigator, "die from mere debility within the first year of their existence; and no one who has not seen these miserable specimens of humanity can have the slightest idea of their diseased appearance; small, thin, and shrivelled, with scarcely strength to cry, it seems almost a crime to attempt to prolong their existence."

How melancholy a sentence for children born to breathe the pure air from the Atlantic! That fifty-five per cent. of deaths under five years of age is a fearful mortality for such a district, is manifest from the fact that in great and not healthy towns the average of deaths at the same period of life for the three years ending 1855 is (omitting fractions), in London, 40 per cent.; Liverpool, 48 per cent.; Manchester, 47; and Leeds, 46 per cent. This element of early mining mortality causes the total average of Cornish children's mortality so greatly to preponderate over other and adjoining counties. Thus, in Cornwall, as calculated from the Registrar-General's Reports, the total mortality of children under five for three years ending 1855, is 36·65; in Devon, 31·84; in Somerset, 30·85. Moreover, it is singular that a striking difference exists in St. Just between the mortality of male and female children, which is on the average eighteen years; the rate of the males being 64·07, and of the females only 45·73—a circumstance which has been attributed to the well-known greater feebleness of male infants than of females in sickly, scrofulous families, and which in any case declares the unhealthiness of the stock. This fact, too, admits of strong confirmation in another particular. It is a natural law, that wherever the infantile death-rate is great, there the birth-rate is high. Taking all England on the average of the three years ending 1855, Mr. Roberton finds 1 birth for every 36 or very nearly 37 of the population; whilst for the same period, in Cornwall, 29 persons give a birth. In the mining parish of Illogan the rate is 1 in 28 persons, and in that of St. Just it is 1 in 25 persons.

Sad as the early mortality is in St. Just, it is even worse in the district of Lelant, the physical geography of which is altogether different from that of St. Just. Many high hills rise within its boundaries, and it is crossed by a few deep vallies, while the watershed of the county passes obliquely through it. Its population consists of the mining, agricultural, and mechanical classes; the mining being almost confined to the high lands, and therefore the miners live in localities much exposed to the inclemency of the weather, as well as in wretched cottages. Whilst in this district there are many families not employed in mining, whose children are healthy, the deaths amongst the children of miners are very numerous. In a certain portion of this mining district, no less than 65·04 per cent. of the males, and about 62·00 of the females, die below the age of five years; whilst the rate for the children of agriculturists dying under the same age is 35·00, and for the females, 33·40 per cent. Every family amongst the miners loses some of its children, and many families can only save one or two out of six or eight children. Is there anywhere a more terrible proof that the induced debility of the father goes down to his children? *Damnatus in metallum* was the sentence of a Roman judge upon a convicted criminal; but the criminal may have lived long before in the free air, *sub Jove frigido.* The poor Cornish miner, however, is *damnatus in metallum* for life, and yet scarcely lives out half his natural days in that stagnant stifling atmosphere; knowing, too, that he is communicating the taint in his blood to the child in his arms, and sending down his own hard sentence to his offspring, entailing upon them feebleness instead of imparting vigour, and making childhood a burden, a mere sickly glimpse of life before the shadows fall!

Referring to the proximate causes of this pitiable mortality and disease, we place foremost among them, *bad ventilation.* That this is not mere opinion, but proved and corroborated fact, is demonstrable.

> "The analysis of eighteen samples of air," says Mr. Mackworth, "taken from four mines in this county (Cornwall), at an average depth of 214 fathoms,

and an average distance of 28 fathoms from any shaft or winze, gave a mean percentage of 17·667 oxygen, 82·848 nitrogen, and 00·85 carbonic acid gas. What had deteriorated this air from its normal elements of 21 oxygen and 79 nitrogen? It had been thus deteriorated by the breathing of the men, the combustion of lights, and the decomposition of mineral, vegetable, and animal substances. How deleterious such an atmosphere must be is too evident from the experiment of a candle, which will begin to burn dimly when the proportion of oxygen in the air is diminished from 21 per cent. to 18, and will be extinguished when this proportion falls to 16; but suffocation will gradually ensue at the point of 14 per cent. It is not less true that permanent injury is caused to the health of men living and working in an atmosphere deficient in oxygen to a much less degree than that which visibly affects the flame of a candle."

The air that does circulate to some extent along the mines is, as the miners expressively term in, so *dead* that in many places a candle, when held upright, goes out in a short time; and the only way in which the miner can obtain light enough to work with, is by putting two candles together, and placing them horizontally. A sufficient proof of the stillness of the air in these mines is afforded by the fact of lanterns being quite unknown in them. In a northern coal mine we have sometimes (not frequently) seen the flame of the candle blown against the hand that held it by the current of fresh air, but this has seldom happened in a metallic mine; and a frequent visitor to Cornish mines had only seen the candle extinguished once or twice by a current of air. No wonder that so many candles are burnt in these mines; in six of them the expenditure of candles alone in one year was at the rate of 22,140 pounds per month. One of the mines, indeed (Balleswidden), is now lighted with gas.

The same causes which render a supply of pure and rapidly circulating air so necessary in coal mines, operate also in metallic mines. The natural law of increase of temperature in proportion to descent is in force in both. This increase does not begin directly upon leaving the surface, but at about the depth of two hundred feet, after which point it increases about one degree of Fahrenheit for every additional fifty or sixty feet. Thus in one of the deepest mines the temperature was 105°, which exceeds the artificial temperature in the up-cast shaft of some coal mines. The temperature of Tresavean mine was reported to ourselves as 90° and upwards in the deepest levels; while, as Mr. Fox informed us, some of the water gushing into the deep level of the United Mines has been as much as from 106° to 108°. Although the currents of air in the shafts and more open galleries of the mine are appreciable, yet in the larger proportion of the galleries no current is perceptible, or at most but slightly so. A considerable number of the levels or galleries communicate only by one extremity with a shaft, or with other levels by a winze at some distance from their inner extremity, and *there* no current whatever can be felt, or indeed be expected. Yet human beings are working, perhaps, at the extremity of the level, and several hundred feet away from any considerable outlet, and in what is equivalent to a long and almost airless dungeon.

To the natural *deadness* of the air must be added the smoke produced from the large use of gunpowder. The hard rock cannot be worked out as readily as the coal strata in coal-pits, but must be chiefly brought down by gunpowder, only the softer and looser portions being dislodged by the pick-axe. Gunpowder was first used for blasting in Hungarian mines in the year 1620, and was known in Somersetshire in 1634, after which date the Cornish miners became acquainted with it. From the small beginnings of that period it has been so extensively employed in this county that the actual quantity used in one year was about three hundred tons (each of two thousand pounds), at the cost of 13,000*l.* In Huel Vor mine the *monthly* consumption at one time was 3500 lbs., while in the same mine the monthly consumption of candles was 3000 lbs. The air, then, in the recesses of that mine had to bear every month the smoke from the burning of 3000 lbs. of candles and 3500 lbs. of gunpowder, and all this must have been generated underground, as neither material could be needed above. What must have been the state of the atmosphere in the deeper levels of that mine—what the diseases—what the deaths caused by its daily inhalation! Allowing that less gunpowder and less candles are consumed in other mines, nevertheless all of them are considerably affected by the same evils, if not to the same degree. Half the quantities would poison the already bad air.

Is there no remedy for this atmospheric impurity? There is, and a very practicable one—viz., *efficient ventilation*, either upon the plan of the Newcastle collieries, or by the use of air-machines and mechanical ventilators. After careful examination, we affirm that there is no insuperable obstacle in the way of the use of either or both. It is a remarkable fact that the method of working a Cornish mine absolutely renders it more capable of ready ventilation than a northern coal-pit. With all the levels and all the winzes properly cleared and connected, there would at once be a system of communication for the air-currents, which might sweep through the whole of the mine. To effect this every *end* should be made to communicate with a winze or a shaft, and no long space should be left to remain a *cul-de-sac* for the air. So far from this being an unremunerative outlay, Mr. Mackworth has shown, in a valuable essay on this subject, that at the United Mines a *saving* of 12*l.* per fathom of working could be realized by improved ventilation and the consequent reduction of the temperature from 105° to 75°. Supposing, however, that the system of split air-currents and furnaces to expand the air, were deemed too great an alteration in the mining customs of the Cornish managers, even then there are the less efficient but very valuable mechanical ventilators, one of which is very simple, so that upon a cylinder rising, the air from the mine rushes up through a pipe and valve, and when the cylinder descends this valve shuts, and prevents the return of the air. By the aid of such a cylinder only six feet long and two feet in diameter, working from two to three strokes per minute, two hundred gallons of air may be discharged every minute. There are other and more complex mechanical ventilators which have produced thorough ventilation in collieries and metal mines, and their first cost would be as a mere trifle when compared with the beneficial results of their constant employment. There are pumps, pneumatic wheels, and water ventilators in abundance, to add to the natural ventilation, if the furnace system or steam jet be disapproved of. There can be no lack of mechanical motive power, but there is a real lack of moral motive to seek out and adopt it. A Cornish "captain," as the mining superintendent is called, will talk to you by the hour upon *adits*, and *levels*, and *lodes*, and *cross-courses*, and prospective *dividends*; but if you animadvert upon the sallowness of the miner's visage, the amount of chest disease, and the early mortality, the captain has either no ear for you, or he simply says—"*That* is not in my department."

One most trying part of the Cornish miner's labour is peculiar to himself. In coal mines the descent is made either by "corf," or basket and rope, or by "cage," a modern invention, and, by either mode, the transference from the surface to the bottom of the shaft is the work of only a few minutes. We ourselves have gone down fifteen hundred feet in five minutes, in an iron tub suspended on a large flat wire rope; but for hard and hazardous modes of descent and ascent, we know nothing comparable to the old, and generally the present system in Cornish and other deep metallic mines. This is simply a series of successive ladders (each in old times fifty feet long, but now about twenty-five feet), all placed slopingly, so as to ease the miner as far as possible. The distance from step to step in each ladder is ten or twelve inches, and at the foot of one ladder is a platform (a "sollar") having a "man-hole," or opening, which leads to the next ladder beneath, and this generally slopes nearly at the same inclination as the one above it. The visitor who flatters himself, when he has descended one long ladder, that he is at the end of his downward course, suddenly sees the sollar opened and another ladder demanding his descent—again another sollar opens, and another ladder appears; thus ever revealing a lower deep in the darkest deep, until he fearfully desires that he may not be taken to the deepest part of the mine. By the time such casual visitor has made his way through a few of the damp, dripping levels, and breathed the dead air for an hour, he will be glad to propose a return, and anything but glad to find that every wooden rung of the ladders must be mounted again slowly and slipperily before he can get one breath of pure air. Three hours of this kind of visitation will fatigue a healthy man, but what is the condition of the poor labourers who have to make this descent every morning, and this ascent every evening *after* a day's hard work and with short breath? We are sure that we shall awaken the sympathies of all when we endeavour to make this hardship realizable in some of the extreme cases of depth.—One mine is 1680 feet deep, and can only be descended by ladders. Now the Monument of London would require to be piled *eight times upon itself* to equal 1680 feet. Stand at its base, and conceiving it to be eight times repeated, endeavour to realize what would be the toil of descending from the summit by ladders, and returning to it again after work—after exhausting work in bad air! Or again, stand in St. Paul's

Churchyard, fix your eye upon the cross of the great dome, and conceive that to be elevated nearly four times higher than it now is, and that you were then bound to ascend to that height by a series of ladders every evening before you reached home, and thus you may realize the miner's task. Once more, assume that a man weighs 160 pounds; then, in ascending 260 fathoms, or 1560 feet (which was the depth of the Consolidated Mines twenty years ago, and they are now 300 fathoms), and in climbing this space in one hour, the man exerts a constant force equivalent to that required to raise 4160 pounds one foot in one minute; or rather more than one-eighth of a horse power. Further, suppose one-third of this force to be expended in the descent, and then you find as the result that one-third of the man's physical strength is expended in going to, and more than one-third in returning from, his work. Upon a fair average of all the mines in Cornwall, deep and shallow, it is estimated that not less than one-fifth of all the muscular power of the Cornish miners is thus expended.

If any one would accompany the miners at the commencement of their return from work, he would see and feel this melancholy circumstance. So soon as the time for "going to grass," as they say, is come, each of the men will take his portion of tools upon his back, amounting to a weight, perhaps of fifteen or twenty pounds. One of the more active will take the lead, and be closely followed by the long string of men gathering together from cell after cell, and level after level, each one striving to keep up with his predecessor, and all winding in and out in a tortuous, still-increasing, tool-burdened, down-bending procession of weary-footed labourers. Up and up ladder after ladder do their weary feet patter, down drops sollar after sollar, only to re-open again immediately; and continuously do they file out upon the surface, and slowly and somewhat moodily wend their way over waste heaps of rubbish and along flowerless paths, over stile and through gate, and by pond and marsh, until they arrive each one at his own cottage door, there to be greeted by a troop of ungovernable children, who know their father despite his begrimed countenance, mudded clothes, and moody visage. All this labour is at the termination of the day's labour,—this hard work comes after all other work, often in cold winds and rain. The verification of Virgil's poetical description is here:—

> "Facilis descensus Averni,
> Sed revocare gradum, superasque evadere ad auras,
> Hic labor, hoc opus est."

Taking all the above circumstances into account, who will wonder that local surgeons find the miners to be more than any other men subject to spitting of blood, to pleuritic and pulmonic stitches, and to other similar ailments demanding the use of the lancet and of blisters? Other classes of workpeople have enjoyed the benefit of Government attention and periodical inspection; factories have their Act of Parliament and inspectors; coal mines have the same, but metallic miners have none. True the coal mine inspection is only directed to the prevention of accidents, yet it necessarily includes supervision of mining hygiene, but the Cornish miners are left to burrow on unassisted, to bend and droop, and suffer and die. The duration of such a man's *active* life being but about eighteen years on the average, this circumstance alone demands public attention, but even this so-termed *active* period is so much interrupted by sickness and accident, that Mr. Couch, surgeon to several mines, states: "From my private notes of attendance on the miners, I find this interruption is far more frequent than with any other class of operatives in the neighbourhood. Many miners work for years with thoracic disease, while other operatives at the same age are healthy and strong." Let it also be recorded that in 1844, the year of greatest mortality from thoracic diseases, the rate of mortality in Lelant was no less amongst the male miners than 75 per cent.! In 1848 it was again so high as 69 per cent.

A mechanical remedy has been devised and partially adopted for the difficulties and toils of the descent into and ascent from the Cornish mines. It is capable of application to all clear perpendicular shafts in connexion with a steam-engine, and certainly struck ourselves as one of the most ingenious and yet simple contrivances we have seen in connexion with mines. It is called a *man machine*. We witnessed it in operation at Fowey Consols Mine, where it extends to a depth from the surface of 1680 feet, heretofore passed through by ladders. It consists of a rod eight inches square, having twelve-inch platforms affixed to it at intervals of twelve feet. There are also equidistant *stationary* platforms at the side of the shaft itself. When a miner purposes to descend this shaft, he finds the rod having a reciprocating motion corresponding with that of the steam-engine with which it is connected. He steps upon the uppermost platform of the rod so soon as it is level with the surface. It then carries him down to the level of one of the platforms stationary on the side of the shaft; on to that one he steps from the rod-platform, which then ascends again and brings up to the miner's present level another platform, on to which he steps from his shaft station, and goes down with it another stage of his journey so soon as the motion of the rod changes. By repeating this process, the miner finally arrives at the bottom of the mine. It is manifest that when there he can, by merely reversing this process, return to the surface as easily as he left it, by repeated twelve-feet stages. Any long measuring-rod moved up and down against the side of a room on which equidistant intervals were marked, would illustrate this procedure. Twelve-feet descents or ascents, with intervals of momentary rest upon stationary steps, complete the whole journey of 1680 feet, during which the miner actually walks down or up the shaft with far more ease than he would walk down or up a mountain of similar height. Two miners can be making the journey in opposite directions simultaneously, and pass each other without danger. Nothing can be simpler, nothing safer, nothing less fatiguing.

This beautiful invention originated in the Harz mines in Germany, and was suggested by an accident in 1833. It was neither so simple nor so perfect at first, and it was but slowly recognised in Cornwall as a valuable invention. A civil engineer demonstrated that 10,000 miners might, by employing this machine, save no less than 39,000*l.* per annum in the value of time alone—their sole capital; and this, too, after paying every expense of constructing and working the machinery, and without reckoning anything for the avoidance of the waste of muscular power or injury to the general health. The history of its adoption at Tresavean Mine, in 1842, is full of instruction and interest.* It was carried to the bottom of the mine in 1843, when Sir Charles Lemon, in an address, observed:

> "Four hundred and sixty miners daily bless the Society [the Polytechnic Society of Cornwall] which projected this scheme, the adventurers who achieved it, and the engineer whose skill has rendered the experiment safe and successful. I hold in my hand a paper of very extraordinary interest; it is a memorial presented to this Society, expressing on the part of three hundred and ninety-one miners of Tresavean, whose signatures are affixed, their gratitude for the exertions of this Society to relieve them from their hitherto distressing and dangerous toil."

Sir Charles then read a simple but grateful letter from the miners, who saved so much time and strength by the employment of this man machine that they were enabled to take the work on lower terms than before, and thus they directly benefited the company as well as themselves.

The weekly loss of time sustained by ladder-climbing is estimated in Cornwall at three shillings, and that by the man machine at ninepence. A mining inspector in Westphalia has shown that the economy in money by the adoption of these helps is considerable. In a mine where 250 men descend and ascend a shaft of 150 fathoms by the rope and bucket, the saving by a man machine—even at its highest cost, 1650*l.*—would not only cover this outlay in the first year, but would also leave a profit of 693*l.* Is it not remarkable that many Cornish, and most if not all the other metallic mines in our country should be without these machines, and still employ the old ladders?

In all that relates to sanitary provision and precaution against disease, these mines remain much as they have always been. It should be mentioned to the honour of Lady Bassett, that she has established baths for the men at her mines at Camborne, Cornwall; but we know of no other similar act of benevolence.

Thus have we drawn attention, we hope not in vain, for the miners' sakes, to that large class of our working people who being out of sight are out of mind. For generations, like human moles they have been burrowing, by slow but certain advances, in subterranean darkness, blind to all the glories and vanities of the upper world. Whilst merchants have been trading and crossing oceans, and compassing sea and land for gain; while armies have been contending upon embattled plains; while kings and princes and counsellors have been counselling and plotting, and falling or triumphing; while ministries have been going out or coming in, politicians blustering, orators rhetorizing, authors composing, poets chanting their lays, and the whole human world, in its various circles, either toiling or trifling, living in pleasure or in industry,—these unknown miners have been hammering, and picking, and blasting, and breaking, at the rate of a few inches or feet daily, hidden from the sun, shut up from the pure air, digging in stone cells and dungeons, living out but half their natural days, and dying but to return to that mother earth in the depths of which they laboured while living and now lie when dead! Truly thankful shall we be if our pen shall be the instrument to point out this neglected class to the sympathy and active benevolence of those who may be enabled in any degree to ameliorate their physical condition.

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* The whole subject is popularly treated in 'Cornwall: its Mines and Miners,' &c., p. 156 et seq.

REVIEW IV.

1. *Researches on the Intimate Structure of the Brain, Human and Comparative. First Series. On the Structure of the Medulla Oblongata.* By J. L. CLARKE, Esq., F.R.S. ('Philosophical Transactions,' Part I. 1858.)
2. *Further Researches on the Grey Substance of the Spinal Cord.* By J. LOCKHART CLARKE, Esq., F.R.S. ('Philosophical Transactions,' Part I. 1859.)

WHEN we take in hand the works of any honest, diligent inquirer whose field of labour has not been the same as our own, we confess to a great disinclination to exalt ourselves to a chair of judgment to pronounce upon the merits or defects of the results he lays before us. If we ourselves have ever put our hand to the work of original research, we know how toilsome and difficult it is, and how little any one is qualified to criticise without having, to some extent at least, essayed the same task, and travelled over the same ground. The work before us is eminently one that arouses this feeling in our mind. It is the result of very great, skilful, patient, persevering labour, and it has already been cordially accepted, by all who are best able to appreciate it, as a valuable contribution to anatomical science. We think then that it is most fitting, and that it will be most acceptable to our readers, if we set ourselves to lay before them a concise account of the chief results of Mr. L. Clarke's researches.

The medulla oblongata consists, as is well known, on each side of an anterior pyramid, an olivary column enclosing the olivary body, a restiform body, and a posterior pyramid, which bounds on each side a surface covered with gelatinous grey matter. A part of this, near the olivary body, has been named the *tuberculo cinereo* by Rolando, and is overlaid and concealed by a system of transverse fibres. These, the *arciform* fibres, he divides into two sets, a superficial and deep. The former he again subdivides into a *first* set, entirely transverse in their course, appearing externally as an arched and flattened band, extending round each side of the medulla from the anterior sulcus to the posterior columns, and a *second*, situated nearer to the lower border of the pons Varolii. "These fibres are sometimes very numerous, and often appear like a distinct fasciculus of the pyramid." The first set is "partly formed by the convexities of many subordinate series of arcs of many sizes, and proceeding from different depths and regions of the medulla."

They may be traced from the bottom of the anterior sulcus, chiefly to the central and posterior parts of the medulla.

The anterior pyramids are larger in relation to the size of the cerebrum in man than in most animals, the larger carnivora forming the exceptions. Mr. Clarke describes them as composed of four orders of fibres:—

> "(1) Decussating fibres from the lateral columns, forming their chief bulk; (2) Decussating fibres from the posterior columns and posterior grey substance, particularly at their upper portion; (3) Decussating fibres from the anterior commissure; (4) Non-decussating fibres of the anterior columns, separate on their outer side, and on their inner side incorporated with those that form the decussation."

The fasciculi of the lateral column are enclosed in the meshes of a beautiful network of bloodvessels, fibres, and communicating cells like those of the adjacent grey substance, and it is from this part that the greater portion of the decussating fibres originate. "In mammalia the decussating fibres are much less numerous than in man." Their number is rather proportional to the prominence than to the breadth of the pyramids; they proceed also more from the deep strata of the lateral columns, and less from the superficial and anterior. In the three lower orders of vertebrata, the pyramids are absent or very slightly marked, though some appearance of decussating fibres is found even in the lowest.

The posterior pyramids are traversed by a network of bloodvessels and radiating fibres derived from a small conical eminence at the posterior border of the central grey mass. At the same time the posterior cornua of the central grey matter come more forward and laterally, and form by their terminal tufts the grey tubercles of Rolando. Into the interior of the restiform body there also projects a mass of grey matter, from near the same part of the posterior horn. These new developments of grey substance the author distinguishes as the post-pyramidal and restiform nuclei, or ganglia. At the same time the anterior grey cornu becomes resolved into network by traversing longitudinal fasciculi of various sizes. In the same way a network is developed from the sides and posterior horn of the grey matter. The network contains a multitude of cells, some fusiform, others developing processes.

The author next gives a detailed description of a transverse section of the human medulla oblongata at a point a little below the olivary bodies. This would be scarcely intelligible without the beautiful illustrative engraving which accompanies the paper, and we must therefore pass it over, only mentioning that at this level the nuclei of the hypoglossal and spinal accessory nerves have begun to appear.

In describing the olivary bodies, the author notices the striking resemblance of their convoluted structure to that of the cerebral hemispheres, stating that the interior fine tubular fibres have the same relation to the olivary plicæ as those of the hemisphere have to the convolutions. The olivary lamina is about $\frac{1}{80}$th of an inch, and contains numerous cells of very various shape, with multiple processes, amounting sometimes to as many as eight from one cell. The olivary body is developed among the network into which the anterior cornu is resolved, and the outer portion of the anterior column. "In relation to the lamina, the course and arrangement of the fibres of the sac are very complicated;" but forbearing to reproduce the author's detailed description, we may say in general that the arrangement is such as to connect the olivary bodies intimately with all the surrounding parts of the medulla, though not with the nerve roots. Mr. Clarke gives his opinion that these bodies are co-ordinating centres for the different ganglia or nuclei of the medulla oblongata. We omit an account of the corpora olivaria of mammalia and birds, only remarking that many have believed that they were absent in these classes.

The author proceeds next to the structural changes in the upper part of the medulla. Within and at the back of the pyramid there is developed a new vesicular system, "which increases as it ascends, and forms the chief part of the grey substance of the pons Varolii." The processes of the cells form a complete network of nearly single fibres. At the inner side of the pyramid, near the bottom of the anterior sulcus, there is formed a large vesicular mass, whose cell processes become continuous with those of the network just described, and also with some of the arciform fibres.

> "The hypoglossal and spinal accessory nuclei continue to increase as they ascend, until by the divergence and diminution of the posterior pyramids they are exposed on the surface of the fourth ventricle. The hypoglossal consists of two cylindrical columns, separated from each other by the raphe, and situate at first in front and at the sides of the canal. . . . . The spinal accessory nucleus on each side is developed in great part from the posterior and lateral portion of the central grey substance. It is overlaid by the root of the posterior pyramid, from which it is afterwards partly developed, and rests, as it extends forwards, on the back of the hypoglossal nucleus."

The post-pyramidal and restiform ganglia also increase as they ascend,

> "And by their lateral extension form nearly one continuous mass on each side of the medulla. . . . . The ganglia or nuclei of the par vagum commence with the fourth ventricle, and are directly continuous with the vesicular columns from which the accessory nerves originate. These vesicular columns, by encroaching on the bases and inner sides of the posterior pyramids, gradually rise to the surface; and diverging to form the point of the calamus scriptorius, enlarge into two pyriform masses along the inner border of the pyramid, from which they are partly developed."

Higher up the vagal nuclei are concealed by dipping beneath two new masses of grey matter—the auditory ganglia, which now begin to appear at the sides of the medulla. At their upper part these vagal nuclei become the centres of origin of the glosso-pharyngeal nerves.

The author takes up now the consideration of the *deep* layer of the arciform fibres, which was postponed when describing the course of the superficial. They arise posteriorly from the post-pyramidal and restiform ganglia, form intricately interlacing fasciculi, and proceed forwards to the lateral column, where the plexus expands; and may be distinguished in its further course into a *lateral* and *deep* portion. The former traverses and surrounds with its fibres the olivary body, assists in forming the transverse commissure, and communicates freely with the one of the opposite side in the raphe. The latter, after leaving the lateral column, sweeps inwards to the remaining posterior part of the raphe. Here, as Mr. Clarke writes,

> "Is the seat of a wonderfully complicated decussation between fibres from all parts of the opposite halves of the medulla, chiefly through the system of arciform fibres, which at the same time connect together all the parts of each separate half. The arciform plexus is everywhere interspersed with circular, oval, pyriform, fusiform, triangular, or stellate cells, of different sizes, which give origin to some of its fibres, and frequently lie against the longitudinal fasciculi, with the fibres of which they are *probably* also continuous, for many of their processes run in the same direction."

The remaining part of the memoir is taken up with tracing the origins of the spinal accessory, hypoglossal, vagus, and glosso-pharyngeal nerves. The rootlets of the first can be followed to the interior grey substance of the cord, midway between the anterior and posterior cornua. Higher up they pass inwards and forwards, through the remains of the anterior cornu. The remaining upper roots of the nerve proceed obliquely inwards and backwards to the central nucleus of the nerve already described, and most of them are continuous with its cells, but one fasciculus turns inwards, and decussates with its fellow of the opposite side.

The roots of the hypoglossal nerve pass inwards in a winding manner through different parts of the olive, and then proceed backwards nearly straight to the nucleus in front of the central canal.

> "Here their fibres diverge across each other in every direction. Many are certainly continuous with processes of the cells; some turn outwards, and run through the network between the bundles of the lateral columns; others bend inward, and decussate through the raphe with their opposite fellows; while the rest pass backwards, through their own nucleus, to that of the accessory nerve."

The roots of the vagus nerve traverse, in several bundles, the gelatinous substance, and cross the plexus, proceeding from the posterior columns in their way to their nuclei. Some of the fibres are continuous with the cells, others form loops around the group of longitudinal fasciculi between its two horns, while a separate bundle passes on to the hypoglossal nucleus.

The fibres of the glosso-pharyngeal nerve pass inwards and backwards, in two or three bundles, through the gelatinous substance, and across the arciform fibres. Some of them turn into the auditory ganglion, some pass to the vagal nucleus, while the anterior, forming a distinct fasciculus, appears to decussate with its fellow of the opposite side.

Mr. L. Clarke describes at length the structure of the caput cornu posterioris in various regions of the cord. The caput consists of the broad and expanded extremity of the cornu, and is separated from the cervix by an imaginary line drawn across from the opposite anterior extremities of the arched lamina of gelatinous substance. Its outer or gelatinous portion consists of nerve fibres, nerve cells, bloodvessels, connective tissue, with nuclei. The anterior or inner and more opaque portion of the caput cornu is continuous with the grey substance of the cervix; besides bloodvessels and connective tissue, it consists of longitudinal fibres, transverse and oblique fibres, and cells. He next describes and traces the tract. intermed. lateralis, a band of fibres from the posterior transverse commissure, running nearly horizontally outwards in different regions of the cord. Subsequently he gives observations on the grey substance of the filum terminale, and on the epithelium of the central canal; and the paper terminates with an appendix, describing fully the method he employs in the preparation of specimens. The work is illustrated by seven plates.

We have now concluded a *résumé* of this remarkable memoir; but we can hardly flatter ourselves that we have succeeded in making this abstruse subject interesting or thoroughly intelligible to our readers. Indeed, this can scarcely be, unless a man girds himself to the task of investigating these matters for himself. To such a one this dry detail will be of the utmost value and interest, and it must for all time remain as a precious acquisition to science, and a monument of the industry and sagacity of the inquirer. Before, however, we lay down our pen, we must advert to a few points of capital importance, and of general significance, which are either established, or more fully illustrated by these researches. We observe (1) the evidence afforded of the intimate linking together of various parts of the centres by commissural fibres; of this, the numerous connexions formed by the arciform fibres is a notable example. (2.) The probability that the olivary bodies have for their function to act as co-ordinating centres for the different nuclei of the medulla oblongata; the evidence for this being their non-connexion with the nerve-roots, in contrast to their intimate connexion with all the other parts of the medulla. (3.) The tracing of nerves distinctly to accumulations of grey matter, and not, as in former times, to motor or sensory tracts. (4.) The evidence of the continuity of cell processes with each other and with nerve fibres. (5.) The tendency manifested by nerves to decussate at their origins with their fellows of the opposite side, and of the opposite halves of the medulla to decussate at the raphe. The intimate blending together of various parts of the encephalon one with the other is a most important fact, which should never be left out of view by the pathologist and clinical observer.

REVIEW V.

1. *A Practical Treatise on Fractures and Dislocations.* By FRANK HASTINGS HAMILTON, M.D., Professor of Surgery in the University of Buffalo, Surgeon to the Buffalo Hospital of the Sisters of Charity, Consulting Surgeon to the Buffalo General Hospital, and to the Buffalo City Dispensary. Illustrated with 289 woodcuts. —*Philadelphia*, 1860. pp. 757.
2. *Handbuch der Lehre von den Knochenbrüchen.* Von Dr. E. GURLT, Privat Docenten der Chirurgie an der Königlichen Universität zu Berlin, Erster oder Allgemeiner Theil. Erste Lieferung, mit zahlreichen in den Text eingedruckten Holzschnitten, fast sämmtlich nach Original-zeichnungen des Verfassers.—*Frankfurt*, 1860. pp. 256.

   Manual of the Doctrine of Fractures. By. Dr. E. GURLT, Teacher of Surgery in the University of Berlin. Part I., with numerous woodcuts, mostly taken from original drawings.
3. *On the Process of Repair after Resection and Extirpation of Bones.* By Dr. ALBRECHT WAGNER, of Berlin. Translated, with an Appendix of Cases, by T. HOLMES, M.A. Cantab., for the New Sydenham Society. Vol. V.—1859.

IN the first work on our list we have a carefully prepared treatise on fractures and dislocations, chiefly with a view to their recognition and treatment. The author, with American practicality, has not troubled himself much about abstract questions of relative frequency, etiology, &c. In the second work, we receive the first issue of the first or general part of a handbook of fractures, which is as characteristic of its German origin. Although as well acquainted with the German as with any other European language, we have yet some difficulty in understanding the etymology of the word "Handbuch," unless it be formed on the *lucus a non lucendo* principle, and be intended to denote the large size and non-portable character of the volume. The "Handbuch" is to consist of four issues in large octavo, each containing from fifteen to eighteen sheets of closely printed matter. The whole of the portion which has as yet appeared is devoted to, and has not yet exhausted, that part of the subject which Dr. Hamilton has merely glanced at and disposed of in about sixteen pages at the beginning of his volume.

Dr. E. Gurlt is already favourably known in Germany as the industrious author of 'Beiträge zur Vergleichenden Pathologie der Gelenkkrankheiten,' Berlin, 1853 ('Contributions to the Comparative Pathology of Joint Diseases'); a work which, compiled when the author had but little clinical experience, consists chiefly of a perfect collection, and a pretty good classification, of cases gathered from all available European and American sources. The same mode of work, the same acquisitive love of collection, and the same knowledge of language, is visible in the "Handbook" before us; but it emanates from the pen of a more experienced man, who gives his own impression with more facility and weight. It must nevertheless be confessed that, however valuable information may be drawn from such large sources, the form in which it is given renders it very unavailable and unreadable. A large part of the work, being composed of abstracts of cases taken from accounts already published, is not strictly the author's own; it is questionable if the value of the book be in any way added to by these means, while its voluminousness and its heaviness, both physical and moral, is greatly increased. The work is embellished by a great number of illustrations, which we are told are mostly after original drawings by the author in fifteen pathological museums of modern Germany; but the execution appears rather below the usual work of German wood engravers; the blocks in this first issue all represent various bones fractured in different modes and places, and although we may feel sure that the direction and position of the fractures will not have been mistaken, there is a want of quality and of texture in the style of workmanship which gives a common appearance and unreliable look to the illustrations.

The second chapter, which treats of the general statistics of fracture, is perhaps that which gains most and loses least by Dr. Gurlt's method of treatment, and is little else than a reprint of the author's paper which appeared in the 'Wochenblatt für Medizinische Statistik' for January 10th, 1857, entitled "Beiträge zur Statistik der Fracturen und Luxationen;" two tables, or rather two sets of tables combined, give, the one the number of cases treated at different hospitals as in-patients alone, the other of those treated both as in and out-patients (ambulant) at other hospitals. The first consists of the statistics from the Hôtel-Dieu (Paris); from the Philadelphia, Pennsylvania, New York, Prague, and Breslau hospitals, each account being of course taken from a separate author;* the sum total gives the following results:—Fractures of head, 597; trunk, 801; upper extremities, 322; lower extremities, 4101. The second table is taken from the Middlesex, Halle, and Berlin hospitals;† and its sum gives for the head, 225; trunk, 604; upper extremity, 2117; lower extremity, 1354. The author remarks that

> "The chief difference between I. and II. lies herein—that in I. the number of fractures of the lower extremities is much higher than that of the upper, as 3200 (upper) to 4100 (lower); while in II. the contrary occurs, in the proportion of 2100 (upper) to 1350 (lower)."

He then goes on to point out that the reason of this discrepancy is, that by far the larger number of cases of fracture in the upper extremity are treated as out-patients; and that he

> "Considers the table No. II. as more adapted to give a correct view of the actual proportions of fractures as they in reality occur among a known population than No. I. can be, in which are included chiefly the severe cases and fractures of the lower extremity that cannot be entrusted to out-door treatment, and from which are excluded cases of infantile fractures. I shall therefore, in the

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* Malgaigne, Wallace, Norris, Lente, Matiejowsky, and Mitteldorpf, respectively.

† Lonsdale, Blasius, and Gurlt.

ensuing pages, *when speaking of the relative frequency of fractures of different parts, refer exclusively to the results of Table No. II.*

"The distribution of fractures among the bones of the head, trunk, upper extremity (with which I also count the clavicle), and lower extremity, is this—about one twentieth of the total sum are situated in the head, about one-seventh in the trunk, not quite one-half in the upper, and nearly one-third in the lower limbs. The sequence, according to the frequency of fracture in the different parts and limbs, beginning at the most frequent, is as follows, and is quite different to that adopted by Malgaigne.* 1, Fore-arm; 2, leg; 3, thigh and clavicle, about equal; 4, ribs; 5, upper arm," and so on. [Here follow, in far smaller proportions, fractures of the remaining parts.]

"In comparing the proportion of fractures according to sex, all observers remark a far more frequent occurrence in the male—that is, if we accept the aggregate of all the tables given by statisticians, although each one differs from the others in his computation. Thus, we find the proportion of fractures in the male to those in the female sex is, according to Malgaigne, as 2½ : 1; according to Lente, as 8 : 1; to Matiejowsky, as 2·283 : 1; to Mitteldorpf, as 3·63 : 1; to my statistics, 3½ : 1. Yet these numbers only apply as stated in the aggregate, inasmuch as age produces very considerable modifications (as a glance at the following table will show); thus, in the earliest years of life a very minute difference only is perceptible; and afterwards the proportion becomes, with increased age, more and more favourable to the female sex; while after the fortieth year there comes a retrocession in the frequency of fractures in the male, so that in latest life more fractures occur among women than men, a circumstance, which I shall soon endeavour to explain. According to my own statistics, the frequency of fractures expressed approximately is:

"From the 1st to 4th year about 1½ times as many in men as in women.
,, 5th to 8th ,, 2⅓ ,, ,, ,,
,, 9th to 12th ,, 3½ ,, ,, ,,
,, 13th to 14th (*sic.*) 8½ ,, ,, ,,
,, 15th to 20th ,, 7½ ,, ,, ,,
,, 21st to 30th ,, 10 ,, ,, ,,
,, 31st to 40th ,, 11½ ,, ,, ,,
,, 41st to 50th ,, 7⅓ ,, ,, ,,
,, 51st to 60th ,, 2 ,, ,, ,,
,, 61st to 70th ,, 1⅓ ,, ,, ,,
,, 71st to 80th ,, 2½ times as many in women as in men.
,, 81st to 90th ,, 7 ,, ,, ,,

"From this table it appears that both decennial periods from the 21st to the 41st year present the greatest disproportion, caused by the fact that on the one hand the male element is (as it appears) more numerous than the female; and on the other hand, that it is exposed, chiefly by its occupation, to more causes of injury. The remarkable exceptions, which the two last decennial periods offer to the rule of greater frequency of fracture in the male, may be partly explained by the statistics of population which (in Berlin, at least) show, that the female sex predominates at an age beyond sixty, while below that age the male sex has the advantage. Besides, in old age the conditions of life in the two sexes approximate; since the men no longer expose themselves in their work to accidents producing severe fractures; but, on the contrary, are obliged to lead, like women, a sedentary life. Again, the skeleton is exposed in both sexes equally to that senile atrophy, which so easily permits fracture. Therefore, fracture will at this age occur in both sexes under much the same circumstances; and hence, therefore, will naturally present most examples in that which is the most numerous. In future, when speaking of fractures of the neck of the thigh bone, we shall have occasion to confirm this law." (pp. 8 *et seq.*)

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* Malgaigne's statistics give the following results: Total fractures of the trunk (including the head), 379; total fractures of the upper extremities, 925; total fractures of the lower extremities, 10·24, or respectively about 1-7th, 2-5ths, or 7-16ths, or better expressed, 0·162, 0·392, and 0·439. Malgaigne reckons the scapula with the upper limb, Gurlt with the trunk.

It has been said, that the general statistics of fracture is that portion of Dr. Gurlt's work which suffers least, in a literary point of view, under his method of authorship, but its reliability on certain points may be doubted. It is certain, that the list of cases treated in hospital do not give a fair view of the relative frequency of fracture in different parts of the body, and that Dr. Gurlt's correction of these defects by taking the sum of all cases treated, whether as out or in-patients, would furnish more reliable results; but the table which has reference to the sex and age in which fractures most frequently occur, furnishes (unless falsified by some fortuitous circumstance or error,) remarkable and singular results. Up to the twelfth year the periods are divided into three quaternary terms; then from the twelfth to the fourteenth year is intercalated a period of only two years; then follows one of six, and the subsequent divisions run in decades. Now, in the two years from the thirteenth to the fourteenth inclusive, there are stated to occur eight and a half times as many fractures in the male as in the female; while in the four preceding years they are only as 3½, and in the six subsequent as 7½ to 1. Dr. Gurlt passes over this remarkable discrepancy without notice: it is one, however, which strikes the mind at once. We may be permitted to doubt the propriety of such a very uneven division of ages, and cannot imagine why such was chosen, particularly as it does not correspond to the likewise unequal sections of the Prussian statistic tables.

Dr. Gurlt accounts in part for the greater frequency of fractures in middle life by saying, that, between the twenty-first and forty-first year, the male element is (as it appears) more numerous than the female. It is well known, that this is quite contrary to our English population, and the words in parenthesis ("as it appears") ("wie es scheint") might lead one to suppose that the author was not quite clear upon the matter, but no such impression, probably, was intended to be conveyed; for it is a curious fact that Prussia is the reverse of England in this numerical relationship of the sexes, and that up to some period between the forty-fifth and sixtieth year, males predominate; the province of Posen affords an exception; but nearly throughout Prussia, and certainly in the towns of that kingdom, this rule holds. In the census of Berlin taken in 1840—the only one accessible to us at the present moment—males number 156,646; females, 154,845, thus distributed in the different ages into which, by Prussian statistics, the population is divided;* under 16, males, 47,399—females 45,140; from

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* The Prussian tables divide the ages, either for military or police purposes, into very unequal and apparently unscientific periods, thus: 0—5, 5—7, 7—14, 14—16, 16—20, 20—25, 25—32, 32—39, 39—45, 45—60, 60 and above; we have in the text added together the lower and higher periods to shorten the statement.

16 to 45, males, 87,888—females, 82,205; above 45, males, 21,359—females, 27,500; showing the remarkable manner in which the males, predominant under the forty-fifth year, yield to the females after that period. We think Dr. Gurlt should have appended some such abstract of a more recent census, since it is impossible for his readers either to test his tables or to use them advantageously, unless they have before them the amount of population, relative ages, &c. &c.

Another portion of this chapter has relation to the ages in which fractures chiefly occur; a table of 1383 cases is given, wherein the ages are more judiciously arranged, and the places of fracture are divided into twenty-eight classes. However valuable such a table may be, as showing approximately the frequency of fractures at all ages, it is, from deficiency of numbers, utterly unreliable, if used as the author uses it, to prove the relative frequency with which any particular bone is broken at different ages. Thus no one can believe that, as a rule, there occur in the first year of existence as many fractures of the scapula, and three times as many of the thigh, as of the clavicle, and that all these happen exclusively to boys; and that in the first ten years of life there should occur fifteen per cent. more broken thighs than collar-bones. Concerning the frequency of all fractures at different ages, the author says,—

> "From our table, whose results show many points of difference from other statistics, we may conclude, that in the age between the first and tenth year, there occur almost as many broken bones as in that between the twenty-first and thirtieth; although in that class of persons to whom fractures chiefly happen, this latter age is exposed to so many causes of accident by its employment in building and other severe open-air work. The great frequency of fractures in the ages of childhood which are not exposed to such causes of injury, may well be ascribed to rachitis, so frequently a predisposing cause of fracture; and indeed this tendency is particularly remarkable between the second and sixth year, a circumstance which may therefore be easily thus explained. From this point to the twelfth year, the number of fractures diminishes, but after that period again increases, and at the fourteenth year are manifested those influences which particularly affect the working classes (from which our statistics are chiefly taken), through changes in the mode of life; since at this time, the boys begin to learn a trade, and the girls to enter some service."

This reasoning is doubtless good as far as it goes, but it must be remarked that Dr. Gurlt has entirely left out the fact that at the youngest age, more persons are alive, than at any later period of life; thus, although there may be absolutely a larger number of fractures before the tenth year, there may be a smaller percentage of broken bones at that time than at any other.

Dr. C. O. Weber, of Bonn, has published some statistical considerations in his late work,* quoting from Gurlt's paper in the 'Monatsblatt für Medicinische Statistik,' and adding his own tables to that author's; but the want of a foundation in facts is here also apparent. He says, "I have not been able to use the Prussian statistical tables; they divide the periods of life into unequal numbers of years, corresponding to sexual development; they cannot be fairly used statistically." He then calculates approximately the relative number of persons in 10,000 in each decennial period of life, and compares proportionally the numbers so obtained, with the frequency of fractures at different ages, and finds that the maximum of fractures (relatively to the number of persons living) occurs between the fiftieth and sixtieth—the minimum between the first and tenth year; there is a smaller increment about the thirtieth year. "Greater age therefore increases proneness to fracture, particularly if the more inactive life of elderly persons be considered, which must diminish the chances of accident; whose greater prevalence in the active life about the thirtieth year is followed by a slight increase in the frequency of fractures." (p. 72.)

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* Chirurgische Erfahrungen und Untersuchungen. Dr. C. O. Weber.

Dr. Weber instituted certain experiments on nine different subjects, four men and five women, to test the fragility of certain of their bones. Supporting them by two points at a known distance, a screw with a dynamometer was forced down till they broke; the numbers, however, are far too few to warrant any general conclusion, but carried further, the results might be valuable.

Direct Experiments upon the Resistant Power of Bone.

WOMEN.

	Age.	Thigh.	Tibia.	Humerus.	Ulna.	Clavicle.
A.	27	725	450	450	290	160
B.	37	775	470	625	175	250 left, 125 right.
C.	40	1000	500	600	310	250
D.	46	800	480	600	310	250
E.	77	760	475	175	200	200 left, 300 right.
Mean	—	812	475	460	248	214

MEN.

	Age.	Thigh.	Tibia.	Humerus.	Ulna.	Clavicle.
F.	24	930	775	1000	500	220
G.	14	1200	750	520	375	260
H. Left	52	875	600	1000	325	280
Right	—	1000	500	550	500	280
I.	65	990	500	575	550	250
Mean	—	995	625	725(729?)	470	258

Distance of Points of Support in Inches.

		Thigh.	Tibia.	Humerus.	Ulna.	Clavicle.
		7	8½	5½	4½	Supported on the body.

We cannot say that the chapters upon the different forms of fractures in Dr. Gurlt's work disclose anything new, although treated with the utmost minuteness, exemplified by cases from all sources, and illustrated by many woodcuts. In the portion which treats of symptomatology and diagnosis occur some remarks concerning the means of investigation which we would notice. Dr. Gurlt, after describing the various forms of displacement and the many causes of deformity, after speaking of the value of comparing the sound with the unsound limb and the knowledge to be gained by mere inspection, proceeds to say:

> "But generally a manual examination (palpation) is also necessary fully to determine the mode and kind of displacement. Such a manual examination, which in recent fractures always causes much pain, is most conveniently undertaken while the patient is under the influence of chloroform, a method of investigation which possesses considerable advantages over the ordinary

mode, because it can be much more careful and exact; because all the obstacles to a lengthened exploration disappear, for instance, pain, which should cause us to keep the patient under examination as short a time as possible, and spasmodic action of the muscles, which is not a little increased by the pain itself. But during anæsthesia an examination may be undertaken in perfect quiet, and if it be a difficult case, may be prolonged as much as occasion may require, which were otherwise impossible. Besides, all displacements may, under chloroform, be reduced in the best manner; and if at the same time the apparatus and bandages be applied, the patient, on returning to consciousness, finds himself in comparative comfort after having borne very considerable pain, which would have been greatly increased by means of the manipulations necessary for diagnosis, reduction, and bandaging, if carried out according to the old method without anæsthetics. It is therefore urgently recommended, that all, even slightly painful examinations, as well as the necessary reduction of displacements, should be undertaken while the patient is in a state of anæsthesia; more particularly for children, in whose power of will we cannot rely, such means is very valuable, and sometimes hardly to be dispensed with."

Occasionally, though rarely, a case of fracture may happen so serious and so painful as to render the production of anæsthesia during the necessary manipulations advisable; but we must protest against a recommendation of its constant use, and particularly in the case of children, to which Dr. Gurlt chiefly directs his observations. Their muscles are so weak, that we can always overcome without difficulty the action, which might produce riding; and children are generally subjected to violence comparatively so small, and their bones are so elastic and slightly brittle, that we very seldom find comminuted and displaced fragments, whose reduction is difficult. Moreover, in those instances, where a young child has been subjected to sufficient violence to produce so complicated an injury, the powers of life are so much depressed, that anæsthesia would be actually dangerous. Even in the case of adults, a surgeon who really knows his anatomy very seldom would require such an aid to form a correct diagnosis or to reduce a displacement. The contraction of muscles in a case of fracture cannot be overcome by main force, and the object is to place the limb in a position, which shall render their spasm harmless. Moreover, let it be remembered that a great number of persons, just before losing consciousness under chloroform, become exceedingly violent, and struggle with great force, and that it is utterly impossible to predicate *à priori* whether a formerly untried patient will or will not go through such condition. This circumstance alone would induce us to refrain from chloroform in all cases which do not absolutely demand it. Dr. Hamilton, we see, agrees with this opinion, without, however, giving the same reasons, for he says:

"I do not often find it necessary to resort to anæsthetics for the purpose of insuring quietude and annihilating pain in making the examinations, since it is seldom that the patient need be much disturbed; but if the examination is not satisfactory, and the diagnosis is important, I do not hesitate to render the patient completely insensible, after which the question in doubt may be more thoroughly investigated, and perhaps definitely settled." (p. 44.)

We cannot undertake to follow Dr. Gurlt through his fifth chapter on the "Etiology of Fracture." The first part, occupying sixty pages, treats of the predisposing, the second portion, of thirty pages, of the immediate causes. The sixth chapter, "The Course of Fractures in General," occupies only the last two pages of the present issue, and is suddenly broken off in the middle of a paragraph on the "Mode of Repair in Fractures," which is to be continued into the next number. This interruption is to be regretted, as upon that very point so much investigation has been employed, and Dr. Gurlt would have given us a *résumé* of all that has lately been done in Germany on that subject.

Dr. Hamilton's work on 'Fractures and Dislocations' is less of a mere compilation, and contains more original matter than is usual in books of Transatlantic growth; and certainly the European reader will find much that is new to him concerning forms of splints and other appliances. Many of these are pointed out as useless, others as actually injurious; but all are ingenious, and some good hints may certainly be taken from many an apparatus described and figured in the woodcuts with which the book abounds. Several of the expressions and modes of turning a sentence will be unfamiliar to European ears; for instance, the entire banishment of the subjunctive mood, as in the sentence already quoted, "but if the examination is not satisfactory" (p. 44). Again, "as when the lower end of the femur is split vertically into the socket" (p. 36), how, in this sentence, is the word *socket* used? Can we accept the following nomenclature?

> "A 'simple fracture' is one in which the bone is broken at only one point. The term has no reference to the question of complications, but in its technical meaning, as employed by both English and American surgeons, it has reference only to the number of fragments into which the bone is broken, so that we may without a paradox say of a fracture, that it is both simple and complicated or simple and compound."

The book generally, in spite of a few such solecisms, is written in plain unaffected language by one evidently practically acquainted with his subject. The chapter on "Fractures of the Femur" is especially full and clear; the question of possible union after fracture of the neck within the capsule is well discussed; Sir Astley Cooper is shown to have held the opinion that such injuries might in rare instances unite by osseous matter, and his name is warmly defended against a charge of want of candour, brought by Mr. Bishop in a Lettsomian Lecture of 1855. Dr. Hamilton, however, falls into a very pardonable error in supposing that these lectures are delivered before the Royal College of Surgeons, and therefore his animadversion on that body is misplaced, for whatever other sins it may have committed or may continue to commit, it is innocent of listening with pleasure on that occasion to slander of one "from the shadow of whose colossal form they were just beginning to emerge." The causes of non-union within the capsule are thus summed up:

> "The persons to whom the accident occurs are generally advanced in life, and consequently the process of repair is feeble and slow.
>
> "The head of the bone receives its supply of blood chiefly through the neck

and reflected capsule, and when both are severed, the small amount furnished by the round ligament is found to be insufficient.

"When the fragments are once displaced, it is difficult, as I have already explained, if not impossible, to replace them.

"The direction of the fracture is generally such that the ends of the fragments do not properly support and sustain each other when they are in apposition.

"The fracture is at a point where the most powerful muscles in the body, acting with great advantage, tend to displace the broken ends.

"Aged persons, who are chiefly the subject of this accident, do not bear well the necessary confinement, and especially as the union requires generally a longer time than the union of any other fracture, so that a persistence in the attempt to confine the patient the requisite time often causes death.

"Whether the absence of provisional callus as a bond of union, and the interposition of synovial fluid between the ends of the fragments, constitute additional obstacles, I am not prepared to say. In the opinion of many surgeons, these circumstances constitute very serious, if not the chief obstacles."

The "many surgeons" in this place are evidently of different opinion to Dr. Hamilton, and indeed our author does not place great faith in the value of provisional callus. He has studied in European schools and hospitals, and not merely through cis-Atlantic literature. The talented author of the 'Autocrat at the Breakfast-table' remarks that "Good American students when they die go to Paris." Dr. Hamilton must have been a *very* good student, for he not only went to Paris before he died, but what we believe better, came to England. Thus, in giving a qualified adhesion to Professor Paget's views on the repair of fractures, he says:

> "I should also do injustice to myself, were I not to mention that at the very moment when Mr. Paget was making his observations upon the specimens in the large collection of fractures in the Museum of the University College [Query, St. Bartholomew's Hospital], I was employed in similar researches, both among cabinet specimens and in the hospitals of this country and of Europe, and that the conclusions at which I arrived were nearly identical with, although the inferences were far from being so complete in their detail, as those to which this distinguished pathologist was himself brought."

At the present time, the interest of this subject—namely, the repair of breach of continuity in bones, whether such breach have been caused by fracture or by resection of portions of the tissue—is very large, and the amount of material which we have before us is a proof of the immense labour, care, and skill now employed in elucidating the minutest points of our difficult profession.

When a bone is broken with so little force that the fragment remains in perfect apposition, and the soft parts around (especially the periosteum) be not injured, it may unite—say Mr. Paget and Dr. Hamilton—immediately, without the interposition of any reparative material. This is a process similar in its nature to the healing by first intention of soft parts, and of which it is difficult to say more than that the fragments resume their continuity. It is, however, scarcely possible to conceive, that either soft parts or bones should reunite absolutely without any formation whatever of new material, and we are inclined to consider this mode of healing only as a very minute degree of Mr. Paget's and Dr. Hamilton's second mode of repair by "a thin intermediate layer of reparative material, which does not in any degree exceed the limits of the fracture; neither does it in more than a trivial degree occupy the medullary canal;"* but if the fragments be somewhat displaced, then this "intermediate callus" will fill up the angle between them. "This is especially apt to occur," says Dr. Hamilton, "in superficial bones, such as the tibia, or upon those sides of the bone which are most superficial. It is not an unusual circumstance to find the shaft of the tibia during the process of union presenting no exterior callus upon its anterior and inner surface, whilst the posterior and outer surface of its circumference is covered by an abundant deposit." Where, however, a greater separation of the fragments occurs, particularly if the fracture be not kept motionless (always the case with the ribs), there an exterior, a provisional (Dupuytren), or ensheathing (Paget) callus will be formed, previous to the establishment of an intermediate or permanent callus. This process was believed by Dupuytren to be the constant mode of repair. Dr. Hamilton, still agreeing with Professor Paget, regards it as unusual in the human adult, more frequent in children, and common in animals. We believe, however, that as the French authority leant rather to the one extreme, so, by a usual reaction, the subsequent investigators have inclined to the other. It appears to us that the formation or non-formation of an exterior callus depends more upon the amount of excitement produced in the surrounding soft parts, than upon any peculiar condition of the bone itself. Thus children's fractures are followed by a callus, because their tissues are more excitable than those of adults, and ensheathing callus is the common mode of union in animals, because they struggle, run, or otherwise set up violent motion of the fragments, producing inflammation of the surrounding tissues. Hence also resections, whether performed in man or animals, will always undergo this form of union, modified, however, by the fact of an external wound admitting air, simulating the case of a compound fracture. Dr. Hamilton himself, the most zealous advocate for the absence of provisional callus, admits

> "That the reparative material, consisting originally of a plastic lymph, is poured out from the vessels of the medullary membrane, the periosteum, the broken ends of the bone, and more or less from all the lacerated tissues which are immediately adjacent to the seat of fracture, that after a period longer or shorter this lymph becomes organized, and begins to receive from the same sources particles of bony matter, through which the consolidation is finally effected."

Hence, even upon this showing, the presence or absence of an ensheathing callus depends upon the amount of reparative material which the surrounding tissues pour forth, which again depends upon the amount of injury or irritation they have received—hence will, *cæteris paribus*, be more abundant after compound fracture with lacerations, and still more so after resection of necrosed bone, or of the heads of bone, or of the whole joint. The last published volume of the New Sydenham Society contains three "selected monographs," all translated from the German; the second is Dr. Albrecht Wagner's well-known treatise 'On the Process of Repair after Resection and Extirpation of Bones.'*

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* Lectures on Surgical Pathology, vol. i. p. 251.

The work is constructed of direct experiments performed by the author on animals, chiefly rabbits and pigeons, of a careful collection and record of all the pathological examinations of such cases in the human subject, and then of a very admirable digest of the various effects produced and reparative processes set up. The translation is in general good; although here and there a sentence may have retained so much of its German construction as to be obscure and involved; but it is evident that Mr. Holmes is hardly acquainted with the technical language of German microscopists, and falling upon a passage treating of minute anatomy, he has translated it so, that it must greatly perplex any of his readers who are not better acquainted than himself with that particular use of the language. The term "Markräume," which means Haversian canals, is translated as medullary cavities—a perfectly different portion of the bone-tissue. This error runs through a whole passage, and renders it perfectly unintelligible. In the same paragraph the compound "Mutterzellen" is literally rendered maternal-cells—an expression not yet English, and to the generality of readers incomprehensible, while every minute anatomist knows what is meant by the term "brood-cell" (pp. 173, 174). A few other Germanisms may well be pardoned, since they rather affect the elegance than the clearness of the work.

The New Sydenham Society and Mr. Holmes have rendered considerable service to those surgeons and pathologists who are still obliged to have recourse to translations, in giving them this very valuable monograph in an easily accessible form; and Dr. Wagner's account of the method of repair after excision may be advantageously compared with the opinions and investigations of other authors on repair after injury. The difference is one of degree rather than of kind, for Dr. Wagner, in speaking of resections from the substance of bones after which the cut ends have been approximated, says (p. 181): "In essentials the process of union is the same as that of fractures. We find the same alterations in the soft parts which surround the situation of the resection, the same alterations of the periosteum, and of the exudation which proceeds from it;" and a little previously in the same paragraph: "If the union has occurred by suppuration, the preceding inflammatory symptoms have never been so considerable, or the suppuration so abundant, so extensive, or so persistent, as in resection of the ends." Thus, when in resections the bones are carefully approximated, the healing processes simulate those carried on in cases of fracture, and more especially of compound fracture, which do not unite primarily.

After such injuries to the bone there arise inflammation and swelling of the surrounding soft parts as a natural consequence of the laceration or irritation they have sustained. By this means the muscles around the injury become at first more or less loosely matted together by means of a tissue-formation between them, and also upon that one of their surfaces, which is next the bony injury. This new growth adhering by its outer surface to, or rather growing from, the muscles, forms by its inner surface a bag, which encloses the ends of the bones, and which is attached to the periosteum, where each fragment enters the sac by passing through its walls. Thus the inflammation and thickening of the soft parts, after a breach of bony continuity, however produced, terminates by enclosing the ends of the bone in a sac of new material, which not only holds these parts together, but also protects the surrounding soft parts from further injury through any undue motion or protrusion of the fragments. This bag, which, according to certain views developed in our last number,* is formed by granulation of the surrounding areolar tissue, undergoes one or more of several changes, according to the nature and course of the case. In cases of resection, and in cases of riding in fracture, the limb is to a certain extent shortened, and is kept in this state by muscular contraction, but after some time (less in animals than in man) relaxation succeeds; and in the former case an interspace will be left between the sawn ends, in the latter the bones fall more nearly into position. "The cavity of the capsule," says Dr. Wagner, "thus increased in size, becomes filled with extravasated blood proceeding from the medullary cavity of the bone." Here, however, we believe him to be wrong in his ideas of the relationship of this clot and the enclosing capsule; we believe the coagulum to be formed from blood poured out on the receipt of injury, and that the capsule grows round, or is moulded upon it and the ends of the bones together, a mode of growth which must certainly take place if the sac originate in granulations, as is shown in the above-mentioned paper to be the case. This is not a matter of great importance as far as the subsequent stages of the healing process is concerned, for the coagulum is not destined to take any active part therein, but on the contrary, to shrivel into the ordinary colourless fibrinous condition of long-effused blood; but as an important part of the material, whereon the capsule is moulded, it is of very considerable importance. Thus, if the blood effused about the sawn or broken ends be large in quantity, and the absorption slow, the capsule will be simple, large and roomy; if, on the other hand, the blood effused be not great in amount, and if the process of shrivelling or absorption be quick, the inner walls of the bag will not have had time to harden into a fibrous or cartilaginous tissue, and the granulations grow constantly into the space left by the disappearing clot. The coagulum in most cases of resection, and some of fracture, will have separated the ends of the bone. When, therefore, it vanishes, its place is taken by a partition, which grows out, is a part, of the inner wall of the capsule; thus the interior of the bag is divided into two parts, each of which contains and closely embraces one end of the bone. This bag, whether simple or compound, is made to perform different offices, according as the case is to terminate in bony union, or in one of the various forms of non-union, or of ligamentous union; but in our opinion it always exists, being sometimes a thin and slightly membranous septum between the fractured bone and the soft parts, sometimes a thick, tough material binding the bones tightly in their place.* The former very transient condition is that which it assumes in the most favourable cases of fracture; the latter that state which we find in displaced fractures and in resections, and upon the subsequent development of this bag and its partition depends the form of union to be produced.

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* A. Wagner: Ueber den Heilungs-prozess nach Resektion und Extirpation der Knochen. Berlin, 1853.

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* Barwell on the Morbid Actions constituting Osteitis, p. 490.

If the bag be simple and remain unossified, it may be gradually converted into a fibrous capsule of constantly increasing density, enclosing the ends of the bone, which will become rounded and polished. This state has been described by Brodie, Howship, an d others, and is (if the paradoxical form of expression be permissible) a true pseud-arthrosis. In still another instance the sac may possess a partition, which gains an attachment to either broken end of the bone, remains membranous, and developing itself more and more into a fibrous tissue, becomes at length almost ligamentous; during this change the surrounding capsule becomes absorbed, and at last that form of non-union is left, which has been described as ligamentous or tendinous, since by such structure the rounded ends of the bone are flexibly joined together.

It is easy to transfer the idea of like processes occurring, not in fractures, but in resections of the ends of bones and of joints; in some of these it is our chief desire to obtain either a pseud-arthrosis or ligamentous junction, such are the shoulder, elbow, &c.; in others, chiefly the knee, we desire to obtain osseous union. The former of these conditions is extremely similar to those giving rise to false joint; the most usual condition is that in which a solid ligamentous cord unites the two bones, but occasionally, as in one out of five cases collected by Wagner, after excision of the head of the humerus a new capsule was formed; in these instances the partition, described as dividing the capsule into two, forms what is called a *meniscus*—viz., a fibrous, inter-articular substance serving the same purpose, and very like in general arrangement the fibro-cartilage in the joint of the lower jaw.†

Thus, the actions of repair after excision and after fracture, when false joint results, are much the same; but it appears that in the former, when a capsule is formed there is also more frequently a meniscus, which may well be accounted for by the actual loss of substance and by the space thereby produced for the growth of granulations between the ends of the bone.

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* This is doubtless what Dr. Hamilton describes as a "plastic lymph," which becomes organized and "receives particles of bony matter."

† Mr. Holmes has added to Dr. Wagner's work a valuable appendix, giving an account of all dissections after excision of joints, which have been described since 1853. Three cases of excision at the shoulder are named, in one of which a new capsule is formed, but no mention either of the presence or absence of a meniscus is made; thus, in eight cases we find two of capsular union. In six cases given by Wagner after excision of the elbow, no capsular but only ligamentous union was found, whereas in the only two dissected cases of the appendix not only a capsule or capsules were found, but true synovial membrane (?); one of these belonged to Mr. Syme, the other to Mr. Bickersteth. Of resection of the hip accounts are extremely scant, but formation of a capsule has not yet been found. At the knee no capsule has been observed, and such a formation is not to be desired.

If a bony union is to be formed, the same course or process of cure must up to a certain point be carried on; but there is a time in the development of the material (whether blastema or granulation) from which the bag is made, when its future career and condition becomes determined either by its gradual conversion into fibrous or ligamentous tissue, or by a still slower change into a crude form of cartilage. Dr. Wagner describes a gelatinous, yellow, and nuclear exudation taking place from the inner surface of the periosteum, which gradually hardens the inner layers into a bluish-white cartilage, the outer ones into a reddish-brown and immature areolar tissue; but he has not given the mode of union or separation between this tissue formed by the periosteum and that hitherto described as a capsule, and it is certain that the periosteum itself cannot be stretched throughout as a diaphragm between the two parts. The cartilaginous internal layer of the capsule is described in the paper in our last number already mentioned, as gradually formed from the granulations of the bag, and not especially connected with the periosteum, except that their internal situation brings them nearer that structure, than other parts of the new tissue.

It may well be questioned, whether it is absolutely necessary to bony union that it should be preceded by formation of cartilage, since Dr. Wagner finds that "the immature cellular tissue which lies next the cartilaginous material in the central layer of the deposit, also takes part in the process of ossification," and was not apparently led to suspect that a change into cartilage preceded in that instance, if by even the shortest time, the change into bone. Of this process, as it occurs in the cartilage, Dr. Wagner speaks thus—

> "The process of ossification commences very soon. Its commencement occurs about the same time at which the cartilage reaches the above stage of development. In consequence of the very defective development of the cartilage, and the very rapid progress of the formation of bone, the healing process after the resection of bones* offers very little that is useful for the study of the process of ossification, all that I have discovered in long-continued investigations of this subject, leads me to support the views developed by Voetsch. I am not in a position to explain the cause of the very rapid commencement and progress of ossification; I have not seen either the development of blood-vessels, or vessels fully formed in the cartilage. The layers of cartilage which lie nearest to the bone ossify the soonest, and then the process goes on to the superficial layers. I have constantly observed, that in the process of ossification a finely granular dark opacity of the intercellular substance always precedes the deposit of large dark granules on the internal surface of the cell walls. At the limits of the ossification the still unaltered cartilage cells and cartilage nuclei are constantly found surrounded by narrow bridges of blackened intercellular substance."†

He then shows that this intercellular substance is normally ossified before the cells, and mentions some facts to prove that osseous lacunæ are formed from cartilage cells, and continues thus‡—

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* Or after fracture.—Rev.

† Sydenham Society's translation, p. 172.

‡ The following is the paragraph already referred to, in which have occurred false translations of certain anatomical terms. The reader will himself be able to judge the result, since the true rendering is annexed parenthetically.

"The fully developed new bony material is very porous in its superficial, but more solid in the deeper layers. Later on it acquires greater solidity on the surface also. In the porous material are found large clear spaces, quite empty in the dried bone, which are surrounded by relatively narrow bridges of bony substance. Thus, the new bony material has the appearance of a wide-meshed net. I consider these spaces as the *medullary cavities* (Haversian canals) of the bone, but I have not arrived at any definite view as to their development. I think I am in a position to assert in the most positive manner, that these spaces do not possess any previously formed element in the organization of the exudation up to the commencement of ossification, from which they can be developed. The only possible assumption which could be founded on these premises would be, that they are formed by the coalescence and subsequent disappearance of several cartilage-cells which do not progress to ossification; but for this view I cannot find any support in my observations. I cannot agree to Bidder's view[*]—viz., that they are formed from cartilage cells, which enlarge into *maternal-cells* (brood-cells) surrounded by progeny, because I have never been able to find any trace of endogenous cell-formation in the exudation when it has been organized into cartilage. For the same reason, I cannot assume that they are formed from the canals of the cartilage. I have never seen these latter, and from this circumstance I derive a support to the idea that they are altogether absent from that immature cartilage which attains only so low a grade of organization as that of which we are speaking at present. I am therefore inclined to Kölliker's[†] opinion, that the meshes which I take to be *medullary cavities* (Haversian canals) are formed by the absorption of previously formed bone. I have found them to possess exactly the properties described by Kölliker. Their contour is irregular, often presenting an eroded appearance; they are larger than the cartilage-cells, elongated and oval, or angular, but with a generally oval figure. I have never been able to find bone-cells more or less eaten out on their walls, as Kölliker has described; but, on the other hand, have often seen processes of the ossified basement-substance projecting into them. Perhaps, however, some other explanation of the development of these medullary-cavities (Haversian canals) may suggest itself to the reader from the sequel."

Thus far the processes whereby bones unite have been traced, but they are all such as occur in the soft parts, and we see no observation of changes in the bone itself. If we find two fragments of bone actually grown together by means of some connecting material, so that the union shall be even firmer than the original tissue, we cannot imagine that they are united by simple agglutination of the new substance, as bricks are joined together by Roman cement. Neither when the fragments are connected together simply by ligament, and the truncated ends become rounded and smooth, can we imagine that the modelling process is performed by machinery altogether external to the bone, while that structure itself is passive. The modern doctrine concerning organic changes in soft parts is that much cell-action precedes and accompanies both formation and absorption of tissue. There certainly must, during reparation of injured bone, be some action in the parts chiefly concerned, and perhaps the clue to these changes was given by Mr. Barwell in the paper already alluded to. That observer describes certain changes in the lacunæ and their contained cells, to which he believes the phenomena of osteitis must be ascribed. Like all steps in a new direction, these observations require collateral con-

[*] Zur Histogenese der Knochen: Müller's Archiv, 1842.

[†] Mikroscopische Anatomie, p. 368.

firmation; it may even be doubtful whether human bones would show interstitial changes after fracture so quickly and plainly as the bones of rabbits (the subjects of the experiments) are described as doing. But until the histological changes in the part chiefly affected be investigated, we cannot believe that the chief processes in the repair of bones have been fully understood.

REVIEW VI.

Catalogus Craniorum diversarum Gentium quæ collegit J. VAN DER HOEVEN.—*Lugduni Batavorum,* 1860. pp. 65.

Catalogue of the Skulls of Various Nations. Collected by J. VAN DER HOEVEN.

SINCE the days of Blumenbach the human skull has been an object of ethnological study, varying in the estimate which has been attached to it at different times and by different writers, but with a distinctly increased and increasing interest. Many distinguished anthropologists have asserted for it the highest rank in the apparatus for the investigation of the natural history of man. Zoologists of the Cuvierian school have failed to see in it those organizational distinctions which they have been led to expect in structures essentially different. Hence they have been induced to conclude that its diversities are not recognisable or not constant, and only of secondary importance when recognised. Still, the acknowledged variety in the cranium, much beyond the five primal orders of Blumenbach,—the intricate connexion of this bony case with the brain, that organ which may be said to belong to man in an especial manner, and on which all his peculiarities are dependent, so intimate that the diversities of one are well known to be reflected upon the other,—and the admitted defective state of the study of this marble casket, of even the materials for study,—all conspire to give value and importance to collections of skulls, all conspire also, together with many minor circumstances, such as the singular and very diversified methods of distortion it has been subjected to by different tribes, to impart consequence to such collections.

Blumenbach, in the third edition of his famous book, gave an index of his collection, amounting to the number of eighty-two specimens.* At the period of his death this number had risen to 245 human crania. And this collection at Göttingen, which will always be famous from the just celebrity of the labours of its founder, has been increased by his successor, Professor Rudolph Wagner, to 310 specimens.†

In the Catalogue of the Anatomical Museum at Leyden, Professor G. Sandifort enumerated the human crania with considerable care. But Professor S. G. Morton, of Philadelphia, was, we believe, the first to print separately a catalogue of human skulls. And this he distributed with so much liberality, and plied to so much purpose, that at the time of his death, he was diffusing the third edition, which was printed in 1849. This third edition catalogued no less than 867 specimens of human skulls, besides those of other animals.

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* De Generis Humani Varietate nativa. 1795.

† Nachrichten von der Universität und der k. Gesellschaft. der Wissenschaften zu Göttingen, 1856. Die anthropologische Sammlung. R. Wagner.

Since the lamented event of Morton's death, the collection has been purchased by a number of gentlemen who were sensible of its great value, and presented to the Academy of Sciences of Philadelphia, where it had been previously kept. As might have been expected, this museum is especially rich in the skulls of different tribes of North American Indians. In the year 1857, Dr. J. Aitken Meigs, under the auspices of the Academy, brought out a new, enlarged, greatly improved, and better arranged edition of the Catalogue of this great "Mortonian Collection."*, In this Catalogue the author has very judiciously retained all Morton's numbers, whilst he has added two orders of subordinate ones to distinguish the various races and the individual examples in each race. Of these latter the number reaches to 1045. Dr. J. A. Meigs has bestowed great pains upon the production of this Catalogue, and has made it a work of much value.

In a subsequent communication to the Academy of Sciences of Philadelphia, Dr. J. A. Meigs reviewed the present state of ethnology, pointed out the vital importance of craniology to this science, gave a summary of what is known concerning collections of skulls in different countries, and urged, with much force and truth, the desirableness of printing exact catalogues of all collections.†

Professor Owen, in preparing his great 'Catalogue of the Osteological Series' contained in the Museum of the Royal College of Surgeons,‡ had given an elaborate and minute enumeration of the fine collection of human skeletons and skulls, in many cases enriched with descriptive and comparative notes of great importance.

In 1857, Dr. George Williamson, of the Museum of the Army Medical Department, in two articles in the 'Dublin Quarterly Journal of Medical Science,' gave a lengthened enumeration and description of the majority of the 601 human crania and skeletons preserved in the museum at Fort Pitt. His arrangement was a new and peculiar one. He adopted four classes :—1. Oval-shaped skulls; 2. Skulls with projecting alveolar processes, or with the nasal bones on the same plane; 3. Skulls with very prominent superciliary ridges; and 4. Skulls with broad and flat faces. In this descriptive catalogue—for so it may be considered—the author directed special attention to a novel feature of distinction among human races—viz., the form of the anterior nasal orifice. This differs remarkably in the different families of man, dependently upon the differing combinations of the forms and inclinations of the superior maxillary, nasal, and other bones. Dr. Williamson has been at considerable pains to study and to illustrate these diversities by a number of figures. Although apparently trivial in itself, the observation is a valid one, and indicates the universal diffusion of that diversity which marks every feature in the various races of man.§

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* Catalogue of Human Crania in the Collection of the Academy of Natural Sciences of Philadelphia. 1857.

† Hints to Craniographers upon the Importance and Feasibility of Establishing some Uniform System by which the Collection and Promulgation of Craniological Statistics, and the Exchange of Duplicate Crania, may be promoted. 1858.

‡ Two volumes. 1853.

§ Observations on the Human Crania contained in the Museum in the Army Medical Department, Fort Pitt, Chatham. 1857.

Of the later efforts in the same direction, it may be mentioned that last year the distinguished Professor of Anatomy at St. Petersburgh, Von Baer, communicated to the Academy of Sciences of that city a long memoir on the ethnographic-craniological collection of the Academy. Although embracing many subjects historical and scientific, and not intended as a catalogue merely, yet a large number of the 350 specimens of skulls of which the collection consists are enumerated in this memoir.*

In Holland, which is the land of museums, there are many fine collections of crania. Among these, the learned Professor of Zoology at the University of Leyden possesses a small private one in his own house, which justice compels us to say is, with the utmost frankness and politeness, rendered available to every scientific visitor to that famous city who may desire to examine it. Its owner, whose eminence is so well-deserved and so justly appreciated in various branches of science, has long been known as a cultivator of anthropology, giving especial attention to the human cranium. It is nearly twenty years since he delivered his first course of Lectures on the Natural History of Man. Professor J. van der Hoeven has now been induced to add to the number of other obligations for which the craniologist will always be indebted to him, by the publication of a catalogue of this collection. The number of specimens in it only extends to 171 skulls, and 39 casts; but these have been selected with so much judgment, and really embrace such an unusual variety, many of which are of the greatest rarity from the difficulty which would attend procuring others, that this catalogue is of particular interest and value. No pains have been spared in its compilation, and besides a brief description of each skull in a few well selected, perspicuous, and expressive terms, its measurements, according to a method of the author's, its condition, its history, and frequent reference to figures and descriptions of other examples, are all added. Although the sex is indicated, and the age in many cases approximately alluded to, we are inclined to think the latter might have been determined rather more definitely with advantage. Notwithstanding, we regard this descriptive portion of the Catalogue as having great merit. The conciseness, lucidity, and elegance of the very brief descriptions are the well-elaborated results of a master observer.

There is no effort at arrangement apparent; so small a collection hardly either required it, or could have afforded materials for it. The Varietas Caucasica comes first, and includes Gentes Indicæ, 1 skull; Gentes Germanicæ, 26 crania; Celtæ, 2; Gentes ex Meridionali Europa, 6; Gentes Slavonicæ, 13; Gentes Scythicæ, 4; Gentes Semiticæ, 6; Gentes, quæ ad Varietatem Caucasiam Blumenbachii pertinent, Africanæ, 3. Then follow Gentes Asiæ, quæ ad Varietatem Malaicam vulgo referuntur, 56; Gentes, quæ Insulas Maris Pacifici et Novam Hollandiam inhabitant, 2; Crania Sinensium, 7; Gentes Varietatis Mongolicæ, 1; Gentes Africanæ, quæ ad Ethiopicam Varie-

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* Mélanges Biologiques, tome iii. 1859. Nachrichten über die Ethnographisch-craniologische Sammlung der Kaiserlichen Akad. der Wissenschaft. S. 38.

tatem pertinent, 38; Crania Americana, 6. This list shows the proportions of the collection, and exhibits its riches in the skulls of Asiatics, chiefly from the Dutch possessions in the Indian Archipelago, and in skulls from Africa, chiefly from the district of the Cape.

After the enumeration of some of the series, the author has added a few pertinent notes on its peculiar forms and mean measurements. In that off the three Arab skulls from North Africa (55–57) there is *a comparison* with the crania of the Slavonic series (36–48). These latter he quite concurs with Professor Anders Retzius in arranging in the brachycephalic category. To this rule we may add, *par parenthèse*, we suspect there may be some exceptions. We do not like to speak off the book on such a point as this. Of four skulls of Russian men, all to which we have access, one only is brachycephalic, and that moderately so. The longitudinal diameter of three of them is alike, 7·5 inches, or, according to the French metrical scale employed by our author, 0·191; that of the fourth is even 6·9 inches, or 0·186; whilst Van der Hoeven's mean longitude, derived from his 12 Slavonic skulls, is only 0·169. But to return to the Arab skulls (55–57), as compared with the Slavonic series (36–48). The author is inclined to regard the former to be of greater size, more oval form, and far less breadth. Here, again, we suspect there may be such variableness as to suggest more complete investigation. The Arab race, essentially nomadic, is one which, in different degrees of purity, is extended over a large part of the globe—from the north and other regions of Africa to the islands of the Indian Archipelago. Even in its origin it cannot be regarded as very restricted. But the diversities it presents in its different tribes, more or less emigrant, have never been sufficiently studied; they have rather served to support the ill-digested and half-informed deductions of the theorist. The only Arab skulls to which we have access are two in number, both of men—one of uncertain origin, and the other that of a sailor from Oman in Arabia, therefore, we may presume, of purer blood than most available specimens. These are far from supporting Professor Van der Hoeven's conclusion. The first is a skull remarkably lofty in the coronal region, with a long orthognathous face, globular calvarium, having its widest point a little above and behind the auditory foramina, and a tall occipital region. The other, although probably thirty years of age, is a very thin, light skull. Its resemblance to the former is close, and it may be best described by comparison with it. The face, however, is prognathous; the nose long. The forehead does not slope backwards so much, and is rather broader; the vertical region is not quite so lofty, and descends more abruptly down, in an almost flat occiput, close to the edge of the foramen magnum. The calvarium, when viewed vertically, is more quadrate; yet both are in an eminent degree brachycephalic skulls, and have no tendency to the oval form. The longitudinal diameter of the first is 6·55 inches, or 0·156; that of the latter 5·55 inches, or only 0·142; whilst Professor Van der Hoeven's mean length, derived from his three Arab examples, is 0·187.

Authorities vary a good deal in the account of Arab skulls. Professor Owen describes one in the Osteological Series of the Museum of the Royal College of Surgeons, derived from the collection of Sir Astley Cooper, but of unknown origin, No. 5562,[*] as having its frontal region low, narrow, and sloping; of average breadth in the parietal region; occiput, convex; nasals, long and prominent. In Dumoutier's fine atlas, plate 45, there are two skulls of Arabs figured from North Africa. One is a decidedly long skull; the other tolerably so; the noses of good length and prominent, and the occiputs rather upright in outline.[†] And the distinguished Professor of Anatomy at Stockholm, Anders Retzius, a zealous craniologist, places the Arabs among his orthognathous "Asiatic Dolichocephali."[‡]

Yet in the Mortonian collection, Dr. J. A. Meigs describes three Arab skulls, Nos. 780, 781, and 784, which are from North Africa, like those of Van der Hoeven's Catalogus and Dumoutier's Atlas, as having low foreheads, broad, flat occiputs, and comparatively short longitudinal diameters, so as to belong to the *brachycephalic* division. These therefore greatly resemble the two we have described above.

We do not cite these discrepancies in order to reconcile them, but to direct attention to their existence, and add a little stimulus to the difficult investigation by which alone their true value can be explained. Whether the Arabs of all regions can continue to be viewed as one homogeneous race is a question deserving special investigation. Careful deductions from a much larger series of examples are clearly required.

The learned Professor, J. Van der Hoeven, has prefaced his "Catalogus" by a few explanatory and other paragraphs, from which there is not any difficulty in perceiving his estimate of the value of human crania in the study of the natural history of man, and the classification of human races. He refers to language to elucidate this subject, to history, to the mode of life of different people, and to other sources, and then adds:

> "Hæc omnia, quanquam fundamentum divisionis non efficiunt, conjungenda sunt cum iis, qui e cranii diversitate nativa desumuntur, characteribus; hi enim nisi fallor primum quemdam ac præcipuum locum tenent, ubi de methodo naturali in disponendis generis humani varietatibus agitur."

These words, from a zoologist of such merit and distinction, are a sufficient refutation to those who would depreciate craniological studies.

In speaking of the "Desiderata Anthropologica," Professor Van der Hoeven regrets the paucity of works illustrating the subject of human skulls subsequently to the period when Blumenbach issued his first Decade. Since the Leyden Professor penned these lines, another has been, we suppose we must say *commenced*—for it is to be hoped that its accomplished author fully intends to continue the series—in the Memoirs of the Academy of Sciences of St. Petersburgh, by Professor Von Baer.* The portion hitherto published contains sixteen very plain lithographic plates, the execution of which has been confided to a hand much more attentive to an ideal line of grace than to that beauty which is always the result of a rendering of nature with fidelity. Besides the lucid descriptions of the skulls in the 'Crania Selecta,' the "Mémoires" contain a long and elaborate dissertation from the same pen upon two out of the series of skulls delineated, and the questions arising out of their history and natural history.† We earnestly congratulate the students of craniology on the accession of an anatomist and physiologist of such just celebrity to their ranks.

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[*] Descriptive Catalogue, p. 867.

[†] Voyage au Pole Sud. Anthropologie. 1847.

[‡] Blick pä Ethnologiens närvarande Standpunkt med afseende pä Formen af Hufvudskälens Benstomme, p. 9. 1857.

Professor J. Van der Hoeven's 'Catalogus' stands upon the very highest ground such compilations can attain to, and will be extensively useful. Besides affording a model in the mode of its execution, we hope that some of the many possessors and curators of similar collections in this and other countries will be induced, by his excellent example, to add greatly to the value of their museums, in like manner, by the issue of Catalogues. However simple in form, they are greatly to be desired, and will prove of the utmost utility.

REVIEW VII.

On the State of Lunacy and the Legal Provision for the Insane, with Observations on the Construction and Organization of Asylums. By J. T. ARLIDGE, M.B., A.B., Lond., &c.—*London*, 1859. pp. 213.

THE object of Dr. Arlidge's book, as he tells us in its preface, is to supply a work on several important subjects connected with the subject of lunacy, "which have never before been so placed before the public." The work is dedicated by permission to the Earl of Shaftesbury, Chairman of the Commission of Lunacy. It is not, therefore, a purely medical treatise, nor is it addressed mainly to the medical profession, but it contains a survey of all matters connected with lunacy from a medical point of view. Many subjects of great social interest are considered in it, and much that it behoves every one, whether medical or lay, to know; and to use the author's own words,

> "It would be difficult to exaggerate the importance of the question of the provision of the insane poor in this country, both to the political economist and the legislator. There are certainly more than 1300 persons yearly affected in mind as to be unfit or unable to take care of themselves and to obtain their own livelihood, and who under this distressing infliction of Providence demand the care and charity of their neighbours and the succour of the State, properly to protect and provide for them. To perform this duty at the least cost compatible with justice to these afflicted individuals, involves a tax upon the community of which few persons have any adequate conception."

To provide for the total number of pauper lunatics in this country, Dr. Arlidge estimates it to cost at present 450,000*l.* per annum, and he calculates that the sum of four millions and a half has already been sunk in providing asylum accommodation for them. He further considers that these charges go on increasing annually at the rate of 45,000*l.* per annum. These are arguments having special weight with the class for whom Dr. Arlidge's treatise was written.

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* Crania Selecta ex Thesauris Anthropologicis Acad. Imp. Petrop. Iconibus et Descriptionibus illustravit C. E. de Baer. 1859.

† Ueber Papuas und Alfuren. Ein Commentar. 1859.

> "In order to a better appreciation of the existing provision for the insane, and its defects, the author has introduced certain preliminary chapters on the number of the insane, on the increase of insanity, on the inadequacy of the existing public provision for the insane, and on the curability of insanity." (Preface, p. vi.)

In the whole range of the subject of lunacy, no question is of greater or more general interest, perhaps, or so frequently put, as the following: Is insanity on the increase? Dr. Arlidge devotes a considerable space to a solution of this problem. But what he demonstrates most clearly in connexion with it is, that a definitive reply to it cannot be given. He shows that the materials do not exist from which anything more than a probable conclusion can be drawn. To the general reader this statement will appear strange, or that any difficulty at all should exist in answering the question, for public asylums are multiplying and increasing on all sides. The Commissioners of Lunacy report that the number of patients inhabiting these establishments amounted in 1843 to 11,272, in 1853 they had increased to 17,412, and in 1858 to 22,310. These figures appear to show a great and a decided increase of the disease, and a cursory examination of them certainly leads to such a conclusion. But a more rigid inquiry will show that the matter is by no means so easily solved, and the difficulty, as is usually the case, results from a confusion in the terms used, and the want of a clear definition of these renders the portion of the work under consideration less easy of comprehension, or at least makes the task of following the argument the more difficult; and since the book is designed for the general reader, this is of the greater importance. The terms, 1, "Increase of the number of patients in asylums;" 2, "Increase of insanity;" and 3, "Increase in the number of the insane," though seeming to signify nearly the same thing, represent different propositions. For example, the first of these, or the increase of the number of patients in asylums, may merely denote the increase of the buildings for the public accommodation of the insane; again, the second, or the increase of insanity, is a totally different question from the third, or increase in the number of the insane, for if fewer cases per cent. died than formerly, and the same number only got well, the number of the insane would be increased, though the number of fresh cases remained stationary. It could not be said under such circumstances that the disease had increased in the frequency, but only that the number of the subjects of the disease had augmented. Dr. Arlidge has not kept these three questions so distinct as we could desire, but with the help of his data we will proceed to give the answer to them separately in our own order. To the first question the statistics already quoted afford a sufficient reply: they show that the number in asylums has decidedly and rapidly increased; and Dr.

Arlidge also is enabled from his investigations to determine the rate of such increase. He says:

> "It therefore appears that the accumulation of insane persons in asylums in ten years between 1843 and 1853 equalled 4898, or progressed at the rate of 614 per annum in the ten years, and of 979·6 (or in round numbers 980 per annum) in the five years under review, or upwards of fifty per cent. faster in the latter space of time." (p. 12.)

These data are, however, only a report on the progress of accommodation for the insane, or what we may call a brick-and-mortar account. They do not even show whether all, or what proportion of the insane are yet accommodated; but on this point we will anticipate a little by extracting the concluding paragraph from the chapter on the Present Provision for the Insane, and its Inadequacy.

> "Hence it would be required," says Dr. Arlidge, "to more than double the present provision in asylums for pauper lunatics, to give room for all and to meet the annual rapid rate of accumulation." (p. 27.)

So that, greatly as the number of asylums has increased, and the patients in them have multiplied, the accommodation is not yet sufficient for the requirements of the country.

With respect to the second question, that is—Has the disease increased in frequency?—there is considerable difficulty in obtaining data whereon to base a trustworthy conclusion; Dr. Arlidge attempts to obtain some clue to a solution of this question by ascertaining the number of fresh cases admitted at different epochs into public asylums; but he writes—

> "An insuperable difficulty to a correct registration of the number arises from the circumstance that, during any term of years we may select, the accommodation for the insane has never for one year been fixed . . . and it may be stated generally that the proportion of admissions will vary almost directly according to the accommodation afforded by asylums, and the inducements offered to obtain it." (p. 15.)

But taking four years, 1854, 1855, 1856, and 1857, he finds that the number of admissions in these years were 7649—7366—7406—and 7895.

> "It is difficult to decide," adds Dr. Arlidge, in commenting on the little variation that exists in the above numbers, "what value should be assigned to these results deducible from a comparison of the yearly admissions, in determining the question of the increase of insanity. Viewed simply as that of the comparative number attacked year by year, it would however seem a not unreasonable deduction from them, that the proportion of persons attacked by mental disorder advances annually at a rate little above what the progressive increase of population is sufficient to explain." (p. 17.)

Thus are these two important preliminary questions answered by Dr. Arlidge, with the help of materials collected with much care from various sources, and examined with considerable patience and skill. His conclusions are, that the number of pauper lunatics in asylums is undoubtedly greater than at any former period; and secondly, that there is no evidence to prove that the number of persons attacked is greater than formerly—in other words, there is nothing to show that the disease is increasing in frequency.

The above are totally distinct from the third question—viz., Is there any increase in the number of insane persons, compared with the number in former periods? The investigation of this question involves an inquiry into the number of the insane, not only in asylums, but in the whole population, and according to Dr. Arlidge's calculations, the proportion of insane to sane in the whole population in 1844 was 1 to 790; in January, 1857, 1 to 600; in 1859, from Dr. Arlidge's own figures (p. 19), 1 to 483.* This latter estimate is the most unfavourable that we have met with. It includes all persons of unsound mind, both lunatics and idiots; and thus Dr. Arlidge answers the third question—viz., that the number of insane in proportion to sane is greater now than in any former period. This leads to the next subject discussed by the author. If the number of insane persons, he remarks, has increased to such an extent, while the fresh attacks have not been numerous in proportion,

> "The increase by accumulation of chronic and incurable cases becomes so much the more remarkable, and an investigation of the circumstances promoting, and of those tending to lessen that accumulation so much the more important."

The circumstances which lead to the accumulation must be obviously, that the deaths and cures together do not equal the number of attacks, and according to the author, the number of fresh cases has not very materially increased; it therefore follows that either the deaths have not been so numerous as formerly, or that the cures are fewer; or lastly, that both are diminished in number. Dr. Arlidge appears to assume that one of these categories is the sole operating cause in producing the accumulation—namely, that the cures have been less than they should be. But doubtless the improved condition of the lunatic tends in some measure to a greater accumulation in their number; for, physiologically speaking, the brain is not a very vital organ, and its diseases do not necessarily interfere with longevity; and when the patient is carefully tended and protected from extraneous causes likely to interfere with health, he is more likely to live than a sane person, more exposed to the vicissitudes of ordinary life. Besides, an improved mode of treatment, whether therapeutical or hygienic, would rescue an equal number of cases from an immediate fatal termination, and place them among the incurables, as it would save from passing into the chronic stage. So that if the cures increased in number, it does not follow that the chronic cases should be diminished. It would be a far more interesting inquiry to compare the number of cures in proportion to attacks in late years, with the results obtained in former years; this does not appear to have been attempted by any writer. It depends indeed, much upon a clear understanding of these questions, whether we should expect that a better accommodation provided for the insane would be followed by a diminution in their number or not. So far as experience has yet shown any result, there has been no decrease in the numbers of lunatics under treatment in asylums, and to us this appears a natural consequence of the present state of affairs with regard to the insane and the legal provision for them.

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* See British and Foreign Medico-Chirurgical Review, No. 41, p. 42.

Dr. Arlidge appears to infer, however, that the cures do not reach the number they ought. He examines into the causes which diminish the curability of the disease, and the first he mentions is the inadequacy of the existing accommodation in asylums for the insane, and which, he states, is not more than sufficient for one-half of the number requiring it. If this is so, or if a state of things at all approaching it exists, who can be surprised that the number of chronic cases goes on increasing. Of course few cases can obtain immediate admission, and what is worse, all must wait their turn. The evil of delay is not to half, but to all, or nearly all. That this evil is great, and that delay in bringing the insane under proper treatment is a special evil, the chapter on the Curability of Insanity, which follows next, will help to convince, and from it we make the following extracts:

> "Dr. Kirkbride, physician to the Pennsylvania Hospital for the Insane, in his book on the 'Construction and Organization of Hospitals for the Insane,' says (p. 2): 'Of *recent* cases of insanity properly treated, between 80 or 90 per cent. recover. Of those neglected, or improperly managed, very few get well.'" (p. 28.)
>
> "At St. Luke's Hospital, London, where the rules require that the disorder be not more than of *one* year duration on admission, the cures have averaged 62 per cent. during the last ten years.
>
> "In the Third Report of Dr. Hitchman, that able physician writes (p. 5): 'It cannot be too often repeated, that the date of the patient's illness at the time of admission is the chief circumstance which determines whether four patients in a hundred, or seventy in a hundred, shall be discharged cured.'" (p. 30.)

The average result of recoveries on admissions obtained in our county asylums at large averages 35 per cent.

Dr. Arlidge, in discussing the causes that operate against the cure of the patients, divides them into two classes—viz., those occurring external to, and those occurring within asylums; and we may perhaps further subdivide these into the medical and the legal hindrances to the curability of the lunatic, and after a careful consideration, we have no hesitation in saying that the latter greatly predominate.

Bearing in mind the importance of early treatment, it will be readily conceived how the curability of many a case is jeopardized, as Dr. Arlidge shows, by the delay that occurs in bringing it under observation. In this country, the ignominy attached to the taint of insanity in a family deters friends from seeking to place a patient in an asylum. The difficulty of obtaining a bed in a public asylum, and the cost of a private establishment, and the legal forms embarrassing the ready admission into either, also act in delaying the period for the patient to be placed under proper care. Moreover, for a patient to be admitted into a county asylum he must be a pauper; and if his condition be rather better in a worldly point of view than that, but not sufficiently good as to afford the expense of a private asylum, a further difficulty interposes—he must be first pauperized; while in the case of actual paupers the extra cost, or supposed extra cost, of the maintenance in the asylums, leads to various subterfuges to prevent the unfortunate lunatic from receiving the immediate benefit prepared for him, "from the prevalence of an economical theory of the much greater cheapness of a workhouse," as Dr. Arlidge mildly accounts for this mode of dealing with the insane on the part of those usually called guardians of the *poor-law*, and not guardians of the *poor*. The patient is thus retained altogether in the workhouse, in what is called the Lunatic Ward; or if not retained for good, at all events until there is no good left in him, and his case becomes unmanageable and probably confirmed. But to show how he may be treated while in the workhouse, we must resort to a few extracts selected from several pages of similar matter. Under the heading of 'Miseries of Lunatics in Workhouses,' we find the following:

"Medical treatment would in truth seem to be not legally provided at all for lunatics in workhouses. . . . .

"As examples of the slight esteem in which medical supervision is held, the Leicester and the Winchcombe houses are quoted. In the former, the visits of the medical officer were only made quarterly, in the latter, by stipulation, three times a week, but in practice very irregularly.

"The interior accommodation, fittings, and furniture, are, if not abominably bad, excessively defective. . . . .

"Patients are frequently kept in bed because there are no suitable seats for them; a tub at times answers the double purpose of a urinal and a wash-basin. . . . .

"Clothing, again, is often ragged and insufficient.

"Loose straw in a trough bedstead usually constitutes the bed for wet and dirty patients to nestle in; and whether the bed be straw or not, the practice of using it night after night, when filthy with dirt and often rotting from frequent wetting, has been many times animadverted upon. . . . .

"Quiet, helpless creatures, from whom no violence could be apprehended, are kept in bed during the daytime, or coerced; and even the dead-house has been made to serve the purpose of a seclusion-room.

"We read of straps, leather muffs, leg-locks, hobbles, chains and staples, strait-jackets, and other necessary paraphernalia, as of yore, worn for days, weeks, or months."

An evil of an opposite character to retaining lunatics in workhouses, and by which the well-doing of the patient is equally hazarded, is also prevalent—that of filling up the available vacancies in asylums by hopelessly incurable cases. As examples, we quote the following:

"Ten persons were sent to the Suffolk Asylum in 1852, nearly 70 years of age; nine over 70; three over 80; sixteen in a state of bodily exhaustion; nine idiots from birth or imbeciles for a very long period.

"We received" (the author quotes Dr. Huxley) "at least twelve persons who in my judgment needed not, and therefore ought not to have been sent—viz., seven aged, being 70, 74, 76, 78, 79, 89, and 82 years; three children of 6, 8, and 10 years, and two adults.

"Again, the facility with which a drunken prostitute finds admission and re-admission is astonishing.

"The extent to which strongly-marked senility is now made the reason for admission to the asylum is, I think, unprecedented.

"Some have been received (writes Dr. Bucknill) in the last stages of consumption, with that amount only of cerebral excitement so common in this disorder; others have been received in the delirium or the stupor of typhus."

We have only space to allude to Dr. Arlidge's second division of causes operating against the cure of the insane. On those in operation within asylums, these are, according to the author, chiefly excessive size of asylums, insufficient medical supervision, and magisterial interference. It is owing to magisterial interference that asylums are excessive in size and that the staff of medical officers is small. The intermeddling is by no means a general rule, and is confined to a few individuals, but who too often talk the others down or tire them out. These men are of the utilitarian school, and act only on their own limited observation: they set no value on learning, authority, or experience of others. Elected as visitors to asylums, they believe themselves at once endowed with knowledge paramount to opinions of Pinel, Esquirol, Conolly, and men of a like stamp. These officials are difficult to convince, for they never listen. Dr. Arlidge is somewhat severe upon them, but his remarks will probably never reach them, as they never read.

The last subject which arises out of the defective state of the law and the magisterial interference which Dr. Arlidge alludes to, is the construction of the building in which the treatment is to be conducted. The present system, we entirely concur with the author, has nothing to recommend it. It is both ill-suited and expensive. Dr. Arlidge's chapter on this subject deserves especial attention; the principles there laid down are in accordance with opinions of those who have thought much and have had great experience on the subject. The same views are found to be inculcated in the various reports of the Commissioners of Lunacy; nevertheless, magistrates, to whom the construction and management of asylums in connexion with the prisons of the country are entrusted, continue to erect buildings on the old expensive plan, unsuitable to the more enlightened systems of modern treatment, and adapted only to the days of chains and leg-locks.

As examples of the evils arising out of architectural hindrances to the proper treatment of the insane, we may enumerate a few incidents that have come to our knowledge, premising, in the words of Dr. Arlidge, that "in the construction of a ward it is necessary from the system in vogue to provide for all the wants of the inmates, both by day and night, to supply the fittings and furniture needed by the little community inhabiting it;" so that an asylum is composed of many distinct establishments, and the patients are dispersed equally through the entire range of building; the sleeping apartments are consequently also widely apart, and are so arranged that no attendant can see into two at one view. The system also includes, as an integral part of it, a multitude of small rooms—cells, in fact—to contain from one to five or six beds. In hospitals it is usually thought requisite to have a nurse in constant attendance throughout the night, and one nurse at a glance can see a whole ward or perhaps two, and thus every patient can be watched with a very small staff of night nurses. But the arrangement of the bedrooms in asylums is such, that to carry out an efficient night nursing, the attendants would be required to be more numerous at night than in the day, which would nearly double the cost of the maintenance. So the insane are locked in to take care of each other—usually at eight or nine at night till six o'clock in the morning. At the hour of unlocking it is by no means an unheard of occurrence for the nurse to find a patient dead, having died by suicide or in a fit during the night. It has happened that by an oversight two patients have been locked into a single room, who, because they were not trustworthy, should have been kept apart; and before morning, one has killed the other.

The following version of an accident was narrated to the writer, the truth of which he cannot vouch for upon personal knowledge, but he gives it as being quite within the range of possibility, and as illustrating the question under consideration. A suicidal female patient managed during the day to secrete a knife, which she took to bed. She slept in a bedroom with four other patients, and the room opened into the gallery of the ward. It was for safety sake that she was placed in a room with others, the hope being that if anything suspicious occurred in the night, one of the others might give an alarm. This is the usual practice, and the only one available under the present arrangement of the building. By it, it is true, the safety of the suicidal is entrusted to four insane guardians more or less under the influence of sleep. The door of the bedroom, as already stated, opened on to the gallery, and it is the duty of night attendants to perambulate these galleries during the night. On the night in question they did so three or four times, but heard nothing. The suicidal patient arose in the night, her companions all being asleep but one. She cut her throat with the secreted weapon. As the blood flowed, the desire for life returned. She cried for help, and knocked with her doubled fists at the door. She appealed to her fellow-patients, who in incoherent words rather applauded her act. At length the poor woman becoming exhausted, she placed her pillow against her throat to stanch the hæmorrhage, and laid herself on the bed with neck pressed against the pillow. In this attitude she was found dead in the morning; the door of the room was smeared with blood and marked by her knuckles.

There are several other matters discussed in Dr. Arlidge's work, which our present space will not permit us to enter upon, and among them certain proposals that the author suggests as remedies to counteract and remove the existing evils. There is little doubt that, postpone it as we may for a while, the importance of the subject of the proper legal provision for the insane will again force itself upon the attention of the public, and if by no other means, by the magnitude of the evils connected with the present system; if these be not speedily arrested, they will soon speak out loudly against themselves. Already one in every fifty paupers are lunatics, and more than one in five hundred of the gross population. When the subject once fairly attracts public attention, Dr. Arlidge's book will become a text-book on its subject, and it will be found to be an epitome of all matters connected with the present state of lunacy.

Review VIII.

Statistical Report of the Health of the Royal Navy for the Year 1857. (Presented to Parliament by Her Majesty's command.) Ordered by the House of Commons to be printed, August 2nd, 1859.

In our number for July of last year, we noticed Dr. Bryson's excellent report on the health of the navy for the year 1856. We are happy that we have now occasion to call the attention of our readers to a similar document relating to the succeeding year; and we hope that circumstances may in future admit of these reports being published annually; as they must necessarily afford greater facilities of comparison, and clearer data for conclusions, where their appearance is regular and consecutive, than where considerable and indefinite intervals occur between them.

Reports on the health of the navy possess advantages which are peculiar to themselves, in the data which they afford as to the origin of epidemic diseases, and the circumstances which influence their course. In such reports, when they relate to the crew of the *same* ship, we are often enabled to mark the rise, progress, and disappearance of epidemics among a given body of men, which is sometimes in a state of entire isolation, at others exposed to extraneous influences; at one time stationary, at others subjected gradually or rapidly to great vicissitudes of climate, temperature, and other external circumstances; again, when such reports relate to the crews of *different* ships stationed in near proximity, which necessarily follow very much the same rules and habits of life, yet some of which may be thrown into greater communication with the shore than others, we obtain the best data for judging of the relative effects of atmospheric influence, endemic causes, and personal contagion, in the production of disease. Such conditions evidently afford materials more favourable for valid deductions than can be obtained from the observation of populations dwelling on shore, where diversities of diet, occupation, and habits, and constant communication with other populations which it is often impossible to trace with accuracy, render it to the last degree difficult to discriminate among the results of atmospheric influence, contagion, and other morbific causes.

Dr. Bryson prefaces his report by the following judicious observations:

"In the introductory remarks to the Statistical Reports on the Health of the Navy for the year 1856, some allusion was made to the importance of correct information respecting the origin of epidemic diseases, but more especially with reference to Asiatic cholera and yellow fever: this kind of information is so much the more to be desired, as the medical officers of the naval service are still at issue on the question of the communicability of these two diseases: hence there is no uniformity or consistency in the opinions held respecting the means to be adopted when either malady makes its appearance in a ship of war. While one class of men, assuming that the disease, like small-pox and measles, spreads by infection, recommends the segregation of the sick from the healthy, and a change of locality, with improved ventilation; the other, believing that it is the offspring of some unknown cause of an atmospheric nature, or of offensive matters contained in the holds, recommends the latter to be cleared out on the spot, and the sick to be removed to the shore, whether the disease may or may not be prevalent amongst the inhabitants. It is clearly evident that one of these modes of procedure must be wrong, or at all events superfluous; for if the disease does not spread by infection, the separation of the sick from the healthy can do no good, but, by creating unnecessary alarm and confusion, may cause considerable evil; but if it does spread, like small-pox and measles, by infection, then a heavy responsibility remains with those who recommend measures which can only tend to its extension, and the destruction of, probably, a third of the ship's company, and possibly hundreds of the population on shore. In 1856, one-fifth of the total mortality from disease in the naval service occurred from yellow fever, and in 1857 the deaths from the same cause amounted to about an eighth, and this on two stations only; but that which is more especially deserving of notice is, that in 1856 nearly the whole of these deaths occurred within a few weeks, in five small vessels, and in 1857, in one line-of-battle ship and two small vessels. In the majority of these instances, the plan adopted was to remain within the tropics, and clear out the holds of the respective vessels; but in others into which the fever was introduced, but did not extend, it was thought better to proceed at once to sea, or to run into colder latitudes, where it—the disease—gradually lost its virulence, and very soon became extinct; for it is a well-known fact that, by some unexplained law peculiar to yellow fever, it ceases to extend in regions where the temperature does not rise above 45° or 50°, and very often it entirely disappears while it is even much higher. If therefore it were possible in every instance to take advantage of this well-known law, and to leave the tropics the instant yellow fever showed itself amongst a ship's company, there is reason to believe that many lives would be saved, without any disadvantage to the public service. Cold, however, does not appear to have any effect in mitigating the severity, or in arresting the progress of cholera morbus; but, with one or two notable exceptions, it has never been known to go on extending for more than one, two, or at most three days in a ship of war at sea, provided the decks were properly ventilated, and the sick kept as much apart as possible from the healthy. With a knowledge of these facts, firmly supported as they are by the medical records lodged in the office of the Director-General, there is reason to hope that the excessive mortality which every now and then takes place from these two diseases, may be either greatly reduced or altogether avoided."

We proceed to notice the returns for the different stations, with some of Dr. Bryson's remarks upon them.

HOME STATION.—There were forty-three vessels employed on this station, with a mean force, corrected for time, of about 10,400 men. The returns, compared with those of the preceding year, show a decrease in the ratio of disease and injury, but an increase in that of invaliding and death. Simple idiopathic fevers were of more frequent occurrence, but there is a marked reduction in the number of cases of the exanthemata. The mortality from diseases of the respiratory organs is somewhat higher, but that from diseases of the alimentary canal lower. The ratio of syphilitic cases exhibits a reduction of nearly two-thirds, owing, probably, in part to the men not being allowed to land so often as formerly, and in part to the more staid and regular habits of the newly-raised men. The aggregate loss of service from wounds and sickness was in the ratio of about 26·6 per 1000 of mean force; but the total loss, including the time the patients were under treatment in hospital on shore, amounted to 39·3—both of which ratios are about a third under those of the preceding year.

The following may be worthy of attention:

> "In the *Melampus*, which lay moored in Southampton Water from February till the end of the year, there were, in a crew of about 170 men, only 4 attacks of ague, and 1 of continued fever; 2 of the former had originally been contracted abroad. Evidence of this kind tends to show that although extensive mud flats are constantly exposed at low water, the locality does not abound in the malaria, or miasmata, which are supposed to give rise to periodic and other fevers. . . . . In the *Excellent*, the stationary gunnery ship, moored in Portsmouth Harbour, and surrounded on all sides by extensive mud banks, there were few or none of those maladies which are usually ascribed to the influence of locality or weather; this is more especially worthy the notice of those who endeavour to connect epidemic diseases, when they occur, with local and general causes, or with causes of a purely hypothetical nature." (p. 3.)

MEDITERRANEAN STATION.—The Mediterranean squadron in 1837 was much smaller than that of the preceding year. The returns received are from thirty-eight vessels, with a mean force, corrected for time, of about 7120 men. The total number of men daily non-effective from wounds or sickness, including the time spent in hospital, was 56·3 per 1000—a slight increase on the ratio of the preceding year. The average number of men daily unfit for service through wounds and sickness, on shore and afloat, amounted to 401, or a little more than five per cent. of the whole force.

> "There were 9476 cases of disease and injury entered on the surgeons' sick-books —208 men were invalided, 53 died of disease, and 24 from wounds, accident, and suicide; the former, being in the ratio 7·4 to the 1000 of mean force, shows that disease was not so destructive of life as in the previous year, when the death-rate amounted to 10 per 1000; but the mortality from injury and drowning—namely 3·4, is considerably in excess of that of 1856. Fevers were less numerous than fatal; but consumption shows an increase of mortality by a little more than one-third." (p. 20.)

WEST INDIES AND NORTH AMERICA.—The returns from the vessels on this station show an increase of disease as compared with those of the previous year; the ratio of men daily non-effective through wounds and sickness is also slightly increased, being 54·7 instead of 51·7 per 1000; but the ratio of invalided and dead is somewhat lower.

The following remarks are curious:

> "Catarrhal affections, which occurred in the ratio of 231 to the 1000 of mean force, were most numerous in the *Arachne*, in which they assumed the form of influenza. This affection first made its appearance while the vessel was cruising off the coast of Cuba, with which, however, she had no communication; but it was subsequently ascertained that it was prevalent in Trinidad, Xagua, and Havannah. There was nothing in the state of the atmosphere to attract special attention; a question therefore arises, whether it might not have been caused by infection wafted from the shore. There are instances on record, improbable as it may appear, which favour this view of the case." (p. 41.)

EAST COAST OF SOUTH AMERICA.—The returns are from eight ships, with a mean force of 1500 men. The ratio of sickness was 1878·8 per

1000, being lower than that of 1856 (2247·5 per 1000). The ratio of cases invalided was 39·4 per 1000, also lower than that of the preceding year (42·5 per 1000). The ratio of deaths was reduced from 20 to 18·7. There was a corresponding reduction in the daily average of men ineffective from wounds and sickness, which for 1856 was 69·7, but for 1857 only 53·1 per 1000.

At p. 59, is a case of diphtheria which occurred on board the *Cumberland*. It supervened on what appeared at first to be cynanche tonsillaris. Tracheotomy was performed with temporary relief, but the patient rapidly sank and died.

PACIFIC STATION.—Returns have been received from fifteen vessels, with a mean force of 2170 men. There were 3119 cases of injury and disease, of which 57 were invalided, and 20 died. Compared with the previous year, the ratio of cases per 1000 of force was considerably less. The rate of invaliding was also less; but the mortality from all causes was increased. The average number of men daily inefficient was 51·8 per 1000, exceeding by a fraction only the average of the preceding year.

AFRICAN STATION.—There were nineteen vessels employed on this station, with a mean force of about 1620 men, including Kroomen, and liberated Africans. The daily ratio of men ineffective from wounds and sickness was 69·3 per 1000, exceeding the ratio of the preceding year by 7. The number invalided was 71, or in the ratio of 43·8 per 1000. The deaths, exclusive of losses by shipwreck, were 27 from disease, 1 from poison, and 8 from accidental causes—in all 36, being rather more numerous than in the preceding year.

Under the head of fever, Dr. Bryson remarks that—

> "The practice of giving quinine, or quinine wine, on distant boat expeditions, has now become so general on the West Coast of Africa, that not to give it is the exception to the rule." (p. 82.)

A summary is given, derived from the medical journals of the squadron, illustrative of the good effects of this practice, and proving that the immunity from fever enjoyed by the men on board ships of war was owing to the use of the quinine, by a contrast of their good health with the mortality among the crews of the merchant ships frequenting the same rivers, but using no preventive. (pp. 82–83.)

CAPE OF GOOD HOPE STATION.—Among seven ships, with a mean force of 1060 men, the daily ratio of men non-effective was 35·1 per 1000. The total loss from invaliding was 46, and from death 15, the former being in the ratio of 43·3, and the latter in that of 14·1 to the 1000 of mean force. Compared with 1856, there was an increase in the ratio of disease and injury, and also of invaliding, but the mortality from all causes was less.

EAST INDIES AND CHINA STATION.—Forty-four vessels, exclusive of gun-boats, were employed on this command, with a mean force of about 7080 men. The daily loss of service through wounds and sickness, on board-ship, on shore, and in hospital, was in the ratio of 87·9 per 1000 of mean strength, being less by 11 than that of the preceding year, but there was an increase in the ratio of invaliding and death, as also in that of deaths from drowning and other accidents. The force suffered very severely from febrile disease, though not by any means so severely as that somewhat similarly employed in 1842, in the river Yang-tse-Kiang. The fevers, which seem in general to have been of a more or less irregular, remittent, or intermittent type, arose from exposure to the emanations from the banks of the Canton River.

> "Fever of an unusual character, inasmuch as it appears to have been of a continued type, made its appearance on the 1st of October in the *Sanspareil*, at Calcutta, where she had been at anchor since the 17th of September, and continued to prevail until the end of the month. 'The attack usually commenced with shivering, which was quickly followed by headache, and occasionally by nausea and sickness, heat of skin, suffusion of the eyes, and thirst; the tongue in most cases remained clean. There were pains in the limbs, joints, and back, great weakness and inaptitude for exertion; the pulse was accelerated, but not much increased in force, and in some cases there was little or no febrile action. These symptoms, after continuing for a few days, subsided, and in most cases recovery was complete in the course of from a week to ten days. With the exception of these, all the cases were of a continued form.' Whatever the primary cause of the disease may have been, the surgeon was of opinion that it was infectious. One case, which had been removed to a hospital on shore, terminated in albuminuria, and subsequently in death. The total number of cases amounted to 229, and the greatest number of attacks daily occurred between the 10th and the 20th of the month." (p. 110.)

A fever somewhat similar to the above, but entered in the surgeon's returns under the head "remittent," broke out in the *Belle-isle* at the same time and in the same anchorage. It spread rapidly until the 15th, when the daily number of cases began to diminish. On that day the ship left Calcutta, and the last case occurred at sea on the 5th of November. The total number attacked was 150, in a crew of 235 men. The average duration of the cases was about eight days, and they all recovered. The disease varied in form and intensity. It was attributed to malaria rising from a bank of fœtid black mud, off which the ship was anchored. The fever did not appear to be influenced either as to its type or severity by exposure on shore, as the men who remained on board suffered equally with others who, being employed in refitting the ship, had leave to go on shore by watches, and to remain there from five till eight o'clock in the evening. (p. 110.)

Dr. Bryson says:

> "It is hardly possible to conceive that the fevers contracted by the people in these two vessels, lying side by side in the Hoogly, could have differed much in their respective type or character, still it is possible (though not at all probable) that in one it may have arisen from a personal, and in the other from a terrestrial cause—hence, perhaps, the difference in the generic form of the disease." (pp. 110-11.)

We should, however, feel much disposed to doubt if any of the cases in the *Sanspareil* were of a *genuine* continued type; three of them are admitted not to have assumed the continued form at all, and the fever in the *Belle-isle*, said to have been "somewhat similar" to that in the *Sanspareil*, was set down as remittent.

AUSTRALIAN STATION.—The force here employed was small, consisting of only three vessels, with a mean strength of about 390 men. Our readers may remember that in the year 1856 the aggregate health of the naval force on this station was unfavourably influenced by the prevalence of disease in two particular ships—dysentery in the one, and a very peculiar form of dropsy in the other. The returns for 1857 not being affected by any such circumstances, show that these regions are highly salubrious to European constitutions. Though the ratio of disease and injury seems to have been nearly as great as in the preceding year, that of invaliding and death was much smaller. There was also a reduction of about one-fifth in the actual loss of service from disease and injury.

> "These results," says Dr. Bryson, "are highly satisfactory as showing what may be called the normal loss from wounds and sickness in the naval service in regions far away from those which have been polluted by the introduction of yellow fever and cholera morbus. How long these magnificent islands, the most healthy perhaps in the whole world, may escape the destructive ravages of these maladies remains to be seen, but assuredly the presence of cholera in the Malay peninsula, at Singapore, and in several of the large sea-ports of China, augurs badly for the future of Australia; for unless the Colonial authorities adopt more stringent measures with regard to infected vessels than was thought necessary in this country and America, it is much to be feared the disease will be imported." (pp. 130-1.)

It is worthy of remark, that two or three men in the *Juno*, who had suffered from the epidemic ascites of the preceding year, were invalided in 1857, in consequence of a recurrence of the same complaint; so that of 31 persons attacked by this singular disease, 14 were sent home as unfit for service. (p. 131.)

IRREGULAR FORCE.—The vessels included under this head were fifty-six in number, and the returns from them exhibit the peculiar diseases of almost every region of the globe. In those ships which were in communication with the shores of Asia, fever, dysentery, and malignant cholera occurred; in those which had intercourse with the ports of the western world, the endemic and yellow fevers were numerous and fatal; while in those which lay for any length of time in the home ports, syphilitic disease caused more inefficiency and loss of service than any other disease in any other part of the world. The loss of service from wounds and sickness was in the ratio of 48·4 per 1000 of mean force, exceeding that of the preceding year. The ratio of invaliding from injuries and sickness was 30·3 per 1000, which exceeded that of the preceding year by nearly one-half. The total mortality from all causes was also higher, in the proportion of 13·5 to 10·5, the increase being attributable to fevers, dysentery, and cholera, contracted on the coasts of India and China.

TOTAL FORCE.—The total mean force, corrected for time, afloat in 1857, amounted to 42,470 men, of all ranks and ratings; and the total number of cases of disease and injury was 66,546, or in the ratio of 1·6 to each person. The average daily ratio of men unfit for service on board was 47 per 1000; but, in addition to this, the daily ratio of those under treatment in hospital was 14·3 per 1000; so that the total number daily inefficient from disease or injury was in the ratio of rather more than 61 per 1000 of mean force—a ratio agreeing in a remarkable manner with that of the preceding year.

On the subject of yellow fever Dr. Bryson remarks—

> "This frightful disease, as in the preceding year, appeared only on the Brazilian Station and in the West Indies; altogether there were about 210 cases, of which 81 terminated in death, or 1 in every 3 attacks. Of the 81 deaths, 56 occurred in the West Indies, and 25 on the coast of Brazil; 49 of the 56 deaths occurred in two vessels—viz., the *Brilliant* and *Orion;* and 14 of the 25 occurred in the *Virago;* these were the only vessels in the whole service in which it acquired epidemic force, and spread by infection. The aggregate number of men in these vessels amounted to about 935; the deaths therefore from yellow fever were at the rate of about 72 to the 1000 persons; while the deaths from primary attacks of continued and remitting fever in the whole remaining force, amounting to 41,535, were 85 only, or in the ratio of about 2 to the 1000 persons; again, the deaths from yellow fever were in the ratio of 386 to the 1000 attacks, whereas the deaths to the 1000 attacks of continued and remitting fever were 31 only; the one disease, therefore, was at least ten times more destructive than the other. The reiteration of facts like these, and the sacrifice year after year in a few vessels of so many valuable lives, will, it is to be hoped, induce those medical officers who still connect the origin of yellow fever with foul holds, or offensive bilge water, or with peculiar conditions of the effluvia arising from the disintegration of organic matter, to a re-examination of the grounds on which they have formed their opinions." (pp. 157-8.)

In respect to the complication of dysentery, which almost invariably attends the fevers of China, and sometimes, though with far less severity, those of the coast of Mozambique, Dr. Bryson says—

> "The experience of many years has thrown little or no light on the true character of the cause or causes of fever and flux in China. The majority of the naval medical officers who have been employed on the station seem to regard the two diseases as depending on the same cause; but no sound proof of this has yet been adduced. It is true that the diseases generally make their appearance at the same time, and with the exception of chronic or recurrent cases, they disappear together; from this, therefore, it may be safely inferred, that if there be more causes than one, they are, at all events, simultaneously developed. Another argument which has been thought to favour the theory of one cause, is the frequent alternation of the two diseases in the same person; where, for instance, the fever is forced to yield to quinine, the flux comes on, and when it again gives way, then the fever returns. In this manner a see-saw is kept up until the constitution of the patient gives way, when one disease—generally dysentery—finally displaces the other, and takes sole possession of its victim." (p. 158.)

At pp. 160–61, Dr. Bryson makes some observations tending to the conclusion that, contrary to prevalent impressions, actual disease of the liver is of rare occurrence, either in this country or within the tropics, unless amongst those who have long indulged in habits of intemperance. Of the state of things in the tropics we cannot speak from experience, but as far as relates to this country, we quite agree with our author, believing as we do that the liver is a much-maligned organ, which is innocent in a great many cases where it is made to bear the chief blame.

This report is drawn up with Dr. Bryson's usual ability. He concludes it with the following satisfactory statement:.

> "Notwithstanding all the additional risk of contracting diseases which do not exist in this country, and notwithstanding all the evils attending or supposed to attend damp decks, overcrowding and imperfect ventilation in ships of war, together with exposure to the humid, sultry atmosphere of equatorial regions, and the cold, biting atmosphere of regions far distant from the tropics, it is gratifying to observe that, one year with another, there is no class of men who enjoy a greater exemption from fatal disease than those employed in her Majesty's naval service."

Review IX.

De l'Hématocèle Rétro-Utérine et des Épanchements Sanguins non Enkystés de la Cavité Péritoneale du Petit Bassin, considérés comme Accidents de la Menstruation. Par le Dr. Auguste Voisin, Ancien interne des Hôpitaux de Paris, &c.—*Paris*, 1860. 8vo, pp. 368.

On Retro-Uterine Hæmatocele and Non-Encysted Extravasations of Blood in the Peritoneal Cavity of the Pelvis, &c. By Dr. Voisin.

The study of pelvic hæmatocele, as a disease peculiar to women, is comparatively new to English medical practitioners. With the exception of a notice in Dr. Tilt's 'Diseases of Women,' and Lectures quite recently published by Dr. West and Professor Simpson respectively, British medical literature is almost entirely barren on this subject, and very few cases have hitherto been recorded. In France this affection has received much attention, and it has furnished a topic for numerous theses, reports, and discussions. It must not be concluded, however, that the disease in question is more frequent in France than in England, because little can be found concerning it in English medical literature; it will probably prove to be by no means rare in this country when once it has attracted sufficient notice, and medical practitioners are conversant with the signs which indicate its presence.

Without entering into the discussion with the author of the treatise before us, as to whether retro-uterine hæmatocele was recognised by Hippocrates and Galen, we will content ourselves with a brief sketch of the more modern investigations concerning it.

Some of the earliest instances, where the recorded particulars leave no doubt as to the identity of the disease, occurred in the practice of M. Récamier, in the Hôtel-Dieu in Paris. One of these was published in the 'Lancette Française,' July 21st, 1831, under the title, "Tumeur Sanguine du Bassin;" a woman, twenty-eight years of age, after a miscarriage, had a large tumour in the true pelvis behind the uterus, which projected into the vagina. M. Récamier, believing it to be an abscess, opened it, but instead of pus, only dark, half-coagulated blood escaped from the aperture. The patient recovered.

Somewhat later, M. Velpeau, in his "Mémoire sur les Cavités Closes," published additional cases, and was evidently acquainted with the true character of these pelvic blood-swellings. Others were reported by MM. Bernutz and Piogey. To M. Nélaton, the distinguished Professor of Clinical Surgery in Paris, belongs the merit of so clearly and accurately defining the pathology of this affection, that henceforth it takes a permanent place in our nosology. In 1850 the learned Professor drew the attention of his class to the occasional occurrence of fluctuating tumours situated between the uterus and rectum, and which on being laid open were found to contain extravasated blood. From the position of the tumour he gave it the name of retro-uterine hæmatocele, a title it still retains. In 1851, M. Nélaton made retro-uterine hæmatocele the subject of clinical lectures in the hospital "La Clinique," which were afterwards published in the 'Gazette des Hôpitaux.' The description there given of the disease is, as M. Voisin remarks, "plain, precise, and clear." In may in truth be said, and that without in the least degree detracting from the merits of those who had preceded him, that until M. Nélaton made it a subject for clinical instruction, it was absolutely unknown to the majority of medical practitioners, both in France and elsewhere. It was only in the year 1850, that M. Malgaigne is reported to have attempted the enucleation of a supposed fibrous tumour of the uterus, which proved to be a collection of blood, and the operation was followed by fatal hæmorrhage. The lectures of M. Nélaton having fairly roused the attention, and shown that the disease in question was by no means so rare as might have been supposed from the little which had been said and written on the subject, several *brochures* speedily followed. Admiring pupils of the Professor took retro-uterine hæmatocele as the title of their theses for graduation, and it furnished a topic for communications and discussions in various learned societies. Among the first and best of the theses was that of M. Viguès, a pupil of M. Nélaton, and later followed those of M. Fénerly, M. Voisin, and others. The thesis of M. Vignés, entitled 'Sur les Tumeurs Sanguines de l'Excavation Pelvienne chez la Femme," was published in 1850, prior to the appearance of M. Nélaton's lectures in the 'Gazette des Hôpitaux,' but he seems to have been indebted to M. Nélaton for his first knowledge on the subject, and he relates the particulars of two examples which occurred in the service of that learned Professor in the Hôpital St. Louis.

The author of the volume before us presented an inaugural dissertation on retro-uterine hæmatocele to the Medical Faculty of Paris in 1858. He informs us in the preface to his present work, that the special favour bestowed on his thesis by several journals and one society, has induced him to continue still further his researches in the same direction; and as in writing the volume now published, he has had the advantage of the latest memoirs on the subject, and has been able to collect additional facts, it may be looked upon as a more complete treatise than his former one. The work bears evidence of much careful compilation as well as of considerable diligence in the elaboration of results; and in drawing conclusions, the author has summed up the various details of all the cases previously published, and thus based his deductions on as wide a basis as was possible under the circumstances. The mode adopted by the author in treating his subject, is, we think, open to certain objections, and we must ask permission to disagree with him on certain opinions which occupy a prominent position, and indeed may be said to be the original and cardinal points in his treatise. While thus candidly avowing our dissent in certain particulars, it is but due to the author to state, that the opinions of one who has expended so much labour on the subject deserve attention and respect. In the first place, we must demur to our author's definition of retro-uterine hæmatocele as not sufficiently comprehensive in its character. The term retro-uterine hæmatocele, pelvic or peri-uterine hæmatocele, or hæmatoma, has usually been employed to designate encysted collections of extravasated blood deeply situated in the pelvis, behind or around the uterus. But according to the definition laid down by M. Voisin only those cases are to be regarded as true hæmatocele in which blood is extravasated into the peritoneal sac, which lies between the uterus and rectum; and further, it is requisite that every case properly coming within this category shall result from some accident of menstruation. Yet, according to the author's own showing (pp. 29, &c.), cases do occur where blood is extravasated into the cellular tissue behind the uterus, and beneath and outside the cavity of the peritoneum. These appear to him to merit rather the name of "thrombus," being akin to those blood tumours which are found occasionally in the external genitals in connexion with the puerperal state. The reasons adduced for excluding blood collections situated in the folds of the broad ligaments from the definition of retro-uterine hæmatocele are, that they may be produced by other influences than those of menstruation, and have for their causes every kind of violence and exaggerated effort. Besides this, it is alleged that the anatomical seat of the tumour between the folds of the broad ligaments, proves it to have no connexion with the organs which are the seat of the menstrual flow.

Now, we think it may reasonably be argued, that to separate these two forms of pelvic blood-swellings so far apart that the one finds no place where the other is discussed, is an unwarrantable violence. The two have so many affinities and so many mutual characteristics, that it can scarcely be doubted that both belong to the same natural order of pathological conditions. Both have their position deeply situated in the pelvis; both arise from the rupture of, or escape of blood from, vessels supplying the organs in the pelvis; and in both, if the extravasation be sufficiently sparing and slow, the blood becomes encysted. The only distinctions attempted to be drawn between the two are, that, in the one, the effused blood is on the inner surface of the peritoneum; in the other, it is on the outer surface; in the former, some disturbance of menstruation is essential to its occurrence; in the latter, a violent effort or some accident is the cause. It may be quite true that in most of those cases where blood is extravasated *inside* the pouch of peritoneum, the organs actively engaged in carrying on the function of menstruation—viz., the ovary, Fallopian tube, or uterus—are the immediate cause of the hæmorrhage; and we believe it is also true that in a large proportion of patients suffering from hæmatocele, the attack dates from a menstrual period; but this is no valid reason for refusing to recognise as instances of hæmatocele, collections of blood *outside* the peritoneum, by whatever cause produced. The term "thrombus" is only another name for a coagulated collection of blood, and might be employed to designate both the conditions named. It would seem indeed as though the author, in order to have a symmetrical definition of the affection he treats, had really fallen into the error of describing merely one variety of it; other varieties differing but slightly—so slightly indeed that the family resemblance is unmistakeable—being excluded by the narrowness of that definition. The question of causation cannot be bound up so closely in the definition of the disease without leading to inconsistency and embarrassment. Blood-cysts in the folds of the broad ligament, argues our author, besides having no connexion with a menstrual period, have for their causes every kind of violence and unusual effort. Nevertheless we find in the history of several of the cases appended to his volume, that the occurrence of menstruation occupied simply the position of predisposing cause, "excess of sexual intercourse;" "violence used during coition with a drunken man," &c., being the exciting causes; and it cannot be doubted that whatever produces congestion of the genital organs, equally with menstruation, will lead to extravasation of blood in some part of the pelvis, when a sufficient exciting cause is also added.

Assuming for a moment that some derangement of menstruation is the cause of all cases of retro-uterine hæmatocele, and that the attack always dates from a menstrual period, the reasoning is equally inconclusive, that the hæmorrhage must be into the cavity of the peritoneum. It is quite true that the ovaries, the Fallopian tubes, and the uterus, are the organs actively engaged in the menstrual act, but it must also be remembered that during a menstrual period, but especially at the commencement, the whole uterine system becomes more vascular, the circulation of the vessels in the broad ligament is increased, the hæmorrhoidal vessels become distended; indeed, all the pelvic organs receive an increased supply of blood, and the abdomen itself is fuller. A condition favourable to hæmorrhage exists in all the pelvic tissues when the catamenia recur, and the vascular congestion can be by no means said to be confined to the organs essentially concerned in producing the secretion. The mode in which blood escapes into the recto-uterine cul-de-sac at such a time may be more obvious than hæmorrhage occurring in any other situation, but there are also physiological reasons predisposing to hæmorrhage in the pelvic cellular tissue, and we think there is sufficient evidence to show that hæmorrhage does occasionally occur there. Post-mortem examinations have not been so frequent as to afford any very extensive data on this point, but the records of eight autopsies have been collected by Dr. West, and of these we find that in two the blood was poured out behind the uterus, and *beneath* the peritoneum; in one, beneath the peritoneum in the iliac fossa, and in a fourth, between the folds of the broad ligament. In a lecture published by Dr. Simpson in the 'Medical Times and Gazette' (August, 1859), an account of a post-mortem examination is given, where the blood tumour was unmistakeably beneath the peritoneum, behind the uterus, and a diagram shows the manner in which the serous membrane was raised up so as to form the roof of the cyst. In another, one of the upper hæmorrhoidal vessels had given way, and produced a blood tumour in front of the rectum.

The opinion, that hæmatocele may be extra-peritoneal as well as intra-peritoneal, is shared by MM. Huguier, Nonat, Robert, Becquerel, Verneuil, and Prost. M. Voisin (p. 212) has attempted to impugn the accuracy of the reports where the extravasation is stated to be outside the peritoneum; and although his reasoning is ingenious, it can scarcely be said to be satisfactory, nor indeed complimentary to the observant powers of the reporters. M. Nonat, a physician attached to La Pitié, after a careful study of this affection, and being well acquainted with the sources of fallacy urged by M. Voisin in regard to the position of the collection of blood, gives his adhesion to an extra-peritoneal, as well as an intra-peritoneal, form of the disease. In his systematic work on the diseases of the uterus, lately published, he even asserts that the extra-peritoneal form is more frequent, though less grave, than the other; and he believes it possible during the life of the patient to diagnose the two varieties, prescribing for each its special treatment. Be this as it may, we think it desirable to make the definition of hæmatocele sufficiently wide, that it may embrace all the forms of tumour resulting from the extravasation of blood around the uterus, whether it be inside or outside the peritoneum, and without reference to the cause producing it. Certain varieties may be more frequently associated with the pregnant and puerperal states than with menstruation, but practically they are attended by the same train of symptoms, and admit of little variation in treatment.

In estimating, therefore, the value of M. Voisin's treatise, it must be looked upon as a monograph simply on the intra-peritoneal form of pelvic hæmatocele, and on this variety of the affection much interesting information is afforded. Of the encysted kind two forms are admitted—the one *simple*, in which the extravasated blood is coagulated into masses, and ultimately absorbed from the place of its deposition; the other, *complicated*, in which the blood becomes altered, suppuration takes place, and the contents of the cyst escape some way or other externally. Of the non-encysted extravasations into the peritoneum two varieties are also recognised—in the one the hæmorrhage is active, in the other it is passive.

As might be expected, retro-uterine hæmatocele belongs to the period of greatest sexual vigour in women. Of 34 observations where the age of the patients is mentioned, 20 ranged from twenty-five to thirty-five years, and thirty years of age was the average of the sum total at which patients were most commonly attacked by it. A diminution or excess of fibrine in the blood is enumerated among the predisposing causes. Thus, Scanzoni has related the case of a patient affected with measles, who died immediately after the commencement of menstruation, from an hæmorrhage which took place from the left Fallopian tube into the peritoneal cavity; and a patient under the care of M. Bouillaud, in La Charité, suffering from modified small-pox, was seized with alarming uterine hæmorrhage when the catamenia recurred three days after the appearance of the eruption. These instances seem to the author to indicate a predisposition to pelvic hæmorrhage during the course of eruptive fevers from the diminution of fibrine in the blood. Again, M. Voisin has observed that a plethoric condition of the system predisposes to this form of hæmorrhage. He noticed that the larger number of patients affected with hæmatocele had an abundant and habitual menstrual flow, the colour of the discharge was bright, and clots were frequent. These signs he considers as indicating plethora, and concludes, therefore, that a plethoric condition favours the formation of hæmatocele. In the larger number of patients whose menstrual history previous to the attack was ascertained, the periods were regular in their recurrence, proving that the disease is not commonly associated with amenorrhœa. In the majority of patients, however, the menstrual periods were attended with pain. In ten cases personally studied by the author, and in which he was thus enabled to gain precise information, the commencement of the affection was traced to a menstrual period; in 7 of these coitus had taken place either during the catamenial flow, or very shortly after its termination, and the pain began during the sexual act. In the remainder of the 10, cold, fatigue, or violence experienced during the continuance of the menses, seemed to have determined the attack.

Under the head of the Pathology of Hæmatocele, three sources or causes of hæmorrhage only are considered, all others being excluded. The three are—congestion and hæmorrhage from the vesicles of De Graaf during a menstrual period; reflux of blood from the uterus into the Fallopian tubes and peritoneum; and lastly, hæmorrhage originating in the Fallopian tube itself. A non-encysted extravasation of blood into the peritoneum may, the author believes, arise from the rupture of varicose veins beneath the ovary, but an encysted intra-peritoneal hæmatocele cannot be produced in this way, because the rapid loss of blood in such a case would prevent all chance of its becoming surrounded by lymph barriers.

Physiological investigation has fully proved that at each ovular period, which corresponds in the human female with the appearance of the menstrual discharge, one or more Graafian vesicles near the surface of the ovary become distended with crimson contents, and at length rupture and discharge themselves into the infundibular extremity of the Fallopian tube. A certain quantity of blood escapes at the same time, but under normal conditions the amount is very small. It is necessary, therefore, in instances where the hæmorrhage from one or other ovary has been so considerable as to give rise to retro-uterine hæmatocele, to presuppose some antecedent morbid alteration in the tissue of the glands. Congestion and hypertrophy of the structures of the ovary, by enlarging the calibre of the vessels, induce a tendency to unusual hæmorrhage at the periods of ovulation; and the same may be said of cystic disease of the ovary. It is by no means an infrequent occurrence in the post-mortem room to find small collections of extravasated blood in the substance of the ovary, and occasionally ovarian cysts are met with filled with coagulated blood, which has been poured into their interior from the rupture of some of the large vessels ramifying in the parietes of the cyst. Death has been known to result from intra-cystic hæmorrhage of the form just mentioned. It can be readily understood how over-distension of a cyst or congeries of cysts in this way, more particularly if the effect of any accident or violence be superadded, might lead to rupture of the cyst-wall and extravasation of blood into the peritoneal sac. M. Voisin has collected six instances in which the ovary was the source of hæmorrhage, and to these he adds six, also arising from lesions of the ovary, where the extravasation of blood was so great that no time was allowed for it to become encysted, and speedy death ensued.

The mucous membrane of the Fallopian tube, which contributes somewhat to the menstrual flux by a sanious secretion from its surface, would seem occasionally, when unusual excitement or congestion exists, to be capable of pouring out so large a quantity of blood, that, escaping into retro-uterine *cul-de-sac*, it gives rise to hæmatocele. M. Voisin, however, has only been able to find two cases in which the hæmorrhage appeared to proceed from the tube, and he therefore concludes that it is far less frequent than ovarian hæmorrhage. Retro-uterine hæmatocele caused by retention of the menstrual fluid in the uterus, and its reflux along the Fallopian tubes into the peritoneal cavity, is still rarer. One observation only of this kind is reported. A patient under the care of M. Trousseau suffered from extreme retroflexion of the body of the uterus, and as a consequence the uterine cavity became distended with menstrual fluid, which being prevented by the displacement from discharging itself through the os uteri, made its way along the tubes, and formed an intra-peritoneal hæmatocele. The sources of hæmorrhage are essentially the same in non-encysted extravasations of blood into the peritoneal cavity; but besides those mentioned for pelvic hæmatocele, the author makes the addition of a fourth for the non-encysted affection—viz., varices of the ovarian or sub-ovarian veins. When hæmorrhage has taken place from this last source, in all the cases which have been recorded, the loss of blood has been so rapid and profuse, that no time has been allowed for it to become encysted, and immediate death has been the result.

The distinction between encysted hæmatocele and non-encysted extravasation lies less in any diversity of causes or sources of hæmorrhage than in the slowness or rapidity of the bleeding, from whatever source it comes. Let blood escape from a congested ovary, from a Fallopian tube or uterus, if the extravasation be slowly poured into the recto-uterine *cul-de-sac*, it ultimately becomes encysted, being surrounded on all sides by lymphy adhesions. If, on the contrary, the hæmorrhage be abundant and rapid, the blood spreads itself over a large surface of the peritoneum, and if the patient does not sink from the loss of blood, death results speedily from the extensive inflammation produced. When the blood has remained some time in the uterine cavity, and become mixed with mucus before coming in contact with the peritoneum, the irritating effect is so much greater than when it flows directly from the exterior of vessels, that even if the quantity extravasated be inconsiderable, the irritating effect is such, that fatal peritonitis almost certainly follows.

The mode in which blood becomes encysted to form hæmatocele in the retro-uterine space of peritoneum is thus described:

> "When the blood escapes from the ovaries, the tubes, or the uterus, it falls naturally behind the broad ligament into the retro-uterine peritoneal space, limited before by the broad ligaments and uterus, behind by the rectum and the lateral folds of the peritoneum, on all sides by serous membrane. Above, the *cul-de-sac* is open, and communicates largely with the rest of the abdominal cavity. In some rare cases the blood is carried in part into the vesico-uterine space, but in very small proportion compared with the mass extravasated behind the uterus. Hardly have some drops of blood penetrated into the serous cavity, than it inflames. This inflammation results in speedily establishing adhesions between all the pelvic organs, or rather between their peritoneal coverings. The coils of intestines are pushed upwards by the extravasated fluid, or rise upwards by their own lightness. The collection of blood encysts rapidly, thanks to the energy of the inflammation of the serous membrane and the formation of cellular adhesions. The sides of the tumour are then limited, before by the broad ligaments, behind by the rectum and peritoneum, below by the recto-uterine *cul-de-sac*, above by the coils of intestines, which, by their adhesions to the fundus uteri, the broad ligaments, the ovaries, tubes, the round ligaments, and the peritoneum which covers the lateral parts of the pelvis, form for the cyst a sort of resisting roof." (p. 137.)

The *symptoms* of non-encysted extravasations and cystic hæmatoceles differ in some important particulars. In the former the commencement of the disease is sudden, perhaps coming in the midst of good health, and by the suddenness and intensity of the attack possibly leading to a suspicion of poisoning. The initiatory symptoms are in all cases intense abdominal pain, similar to that produced by an attack of peritonitis, the patient being thrown into the most violent distress and agitation. The symptoms, indeed, bear a very close resemblance to those produced by perforation of the stomach or bowel, with extravasation of their contents into the peritoneal sac; but in addition, we have the anæmia produced by the sudden and profuse loss of blood. The belly becomes tender and hard, as well as dull on percussion. Hiccup and vomiting are sometimes present; the temperature of the skin is low, and its surface pale and blanched. Syncope or complete collapse speedily follows, with a small and almost imperceptible pulse, and death ensues in less than twelve hours. The incipient symptoms of encysted hæmatocele in the peritoneal cavity are to some extent the same in character as in the non-encysted, but those common to both are somewhat less in severity. They may be compared to those of a limited peritonitis, those of the non-encysted form being more like the symptoms of general peritonitis. The attack dates commonly from a catamenial period, which has perhaps been attended with more than usual pain, the discharge being inordinately profuse, and being prolonged beyond the normal limits. Then, immediately following some unusual effort, or coitus, comes sudden and intense pain, increased by the slightest pressure or movement. The pain is referred chiefly to the pelvic cavity, and is often compared to the throes of parturition. A feeling of weight about the anus, and a sense of extreme fatigue, are also frequently experienced. Very shortly the patient or medical attendant discovers the existence of a tumour, which can be felt through the abdominal parietes above the pubis. Ordinarily, M. Voisin says it is more prominent on the right than on the left side, and may extend itself even in front of the iliac fossa. Pain and difficulty are experienced in emptying the bladder and bowel. The physical characters of the tumour are dulness on percussion, softness and fluctuation at first, and later it is irregular and of unequal density. Examined by the vagina it is felt pushing forward the cervix uteri, flattening the rectum behind, and stretching the walls of the vagina, which are rarely of a violet colour. Very often it fills the inferior strait of the pelvis, and projects downwards to within five centimetres of the vulva. The general symptoms are such as are observed in cases of peritonitis—nausea, vomiting, rigors, intense fever, and facies Hippocratica. To these is added a rapid decoloration of the skin, which assumes a dull whiteness, and is not unlike that which accompanies the cancerous cachexia.

The progress of the disease is variable, setting in sometimes with great violence, at other times assuming a subacute character. In the majority of cases the progress is rapid, and the tumour attains its largest size in a very short time from the commencement. In a few days the pelvic mass is often so large as to be compared to the size of a child's head, and rarely increases in size after the first formation. A careful study of well-marked cases has shown that very speedily after the swelling has reached its maximum development, the natural tendency is to a decrease in size. The tumour becomes hard to the touch, of unequal density, and the sensation of fluctuation gradually disappears. These alterations in consistence arise from the changes which take place in the extravasated fluid. The serum of the blood is quickly absorbed, while the coagulum remains for a much longer period, some portion of it being found even months after the date of the attack. It is noted as a curious fact in connexion with recovery by resolution, that after the formation of the tumour, recurrence of the menstrual period seems to exercise no influence in increasing its size. On the contrary, when menstruation is re-established again, each period is marked by a notable diminution in its volume; and it seems indeed that, instead of undergoing a gradual and continuous decrease, the swelling receded by successive steps, which correspond to the catamenial periods. The average period of duration when cure takes place by resolution is four months. In one case the blood was entirely re-absorbed in six weeks, but in another eight months elapsed after the invasion of the disease before all traces of induration in the post-uterine space had disappeared.

Although, therefore, recovery by resolution may be said to be the rule when no interference is resorted to, yet in a considerable proportion of cases resolution does not take place, and the fluid contained in the hæmatocele makes its escape externally. In 27 instances where no operative treatment was adopted, 6 emptied themselves by the rectum, 3 by the vagina, and 4 burst into the general cavity of the peritoneum. M. Voisin draws a distinction between simple evacuation of the contents of the cyst and evacuation following suppuration. Thus, in Observation xxix., the patient, after experiencing a reaccession of her original symptoms, passed from the bowel a quantity of fluid compared to currant jelly, and from that time the tumour sensibly diminished, and recovery soon took place. In this case it is believed that no suppuration took place, and that some simple ulceration of the walls occurred, resulting in perforation and subsequent evacuation. Termination by suppuration is stated to be very rare.

The chapter on Diagnosis is practically one of the most important contained in the volume. We content ourselves with a brief analysis of the differential diagnosis of retro-uterine hæmatocele. The affection which of all others bears the closest resemblance to pelvic hæmatocele, and which is most likely to be mistaken for it, is peri-uterine inflammation, pelvic cellulitis, or pelvic abscess, as it has been variously named by different authors. The inflammatory affection is far more frequent than hæmatocele, but so many symptoms are common to both that the greatest care is often needed in forming a correct diagnosis, and in some cases we doubt if the nicest discrimination will prevent the one being mistaken for the other. Commonly, in each a tumour is formed behind the uterus, pain is referred in both to the same region, and inflammatory symptoms are present in both. Even the physical signs of both bear in some cases so considerable a resemblance that they may readily be misinterpreted.

M. Voisin admits the difficulties which surround the diagnosis in retro-uterine hæmatocele, and particularly the diagnosis of hæmatocele from retro-uterine inflammation and abscess. The chief points of difference upon which the author is disposed to rely are the following—viz., post-uterine abscess is not so constantly connected with some accident of menstruation; has no coincident menorrhagia, and does not attain suddenly its greatest intensity. The tumour is not formed from the very commencement; the skin does not suddenly become anæmic; the mass, hard at first, becomes later soft and fluctuating, the contrary being the case usually in hæmatocele. The constitutional symptoms follow an inverse order from those of hæmatocele. Moreover, pelvic inflammation and abscess are often consecutive to abortion or delivery; and when this is not the case, have often some relation to inflammation previously existing in some part of the genital passages. In the phlegmonous disease the tumefaction occupies much oftener the lateral and anterior parts of the pelvis, and is much more sensitive to pressure, the slightest touch causing pain.

Since we cannot accept the assertion of MM. Bernutz and Goupil, that the larger number of cases of peri-uterine inflammation are instances of partial peritonitis, we may add, that in the peri-uterine inflammation, if it be at all extensive in character, the cellular tissue behind the uterus and in the broad ligaments becomes infiltrated with fibrinous exudation. This fixes the uterus, so that it cannot be elevated or depressed, and the broad ligament and post-uterine tissue become hard as a board, and feel like an irregular tumour springing from the osseous boundaries of the pelvis. This condition is much less marked in cases of pelvic hæmatocele.

The diagnosis between hæmatocele and ovaritis is stated also to be very difficult. It is possible, however, by carefully attending to certain peculiarities in the course of each, to distinguish between them. Thus, there is no such sudden invasion or rapid formation of a large tumour, in inflammation of the ovary as in hæmatocele. No sudden anæmia or coincident menorrhagia, and the symptoms gradually increase in severity from the commencement; while in hæmatocele, the most severe and distressing symptoms are developed from the very first, and as time passes, undergo a gradual amelioration. Encephaloid tumours, which from their consistence and position may be mistaken for hæmatoceles, are to be distinguished by their history and the presence or absence of a cancerous cachexia. The various forms of ovarian tumour which may occupy the retro-uterine *cul-de-sac* are in general to be diagnosed by their slower growth, by the absence of urgent symptoms at the commencement, and by the difference in the character of the fluctuation. To these may be added their capability of being moved in many cases independently of the uterus, when the sound is introduced into the uterine cavity, and perhaps also of being pushed upwards into the abdominal cavity.

Some forms of extra-uterine gestation bear a very close analogy to hæmatocele, and we are told that MM. Robert and Huguier actually fell into the error of supposing a tumour, which was an extra-uterine fœtation and occupied a considerable space in the pelvis and abdomen, to be an hæmatocele. The absence of urgent symptoms in the commencement, and the presence of the usual indications of pregnancy, are the chief guides in discriminating between the two conditions. We would here remark, that the author does not seem fully to appreciate the difficulties which would surround the diagnosis of an early extra-uterine fœtation bursting into the cavity of the peritoneum, from retro-uterine hæmatocele or non-encysted blood-extravasations into the peritoneum. Instances have occurred from time to time where an impregnated ovule being detained in the tube, has, after a very short period of development, burst its containing limits, and led to fatal hæmorrhage into the peritoneal cavity. The suppression of the menses, the changes in the mammæ, and alterations in the cervix and body of the uterus, would of course be the chief indications of the existence of pregnancy, but the early period of gestation in these cases may possibly cause the symptoms of pregnancy to be very imperfectly developed, and if the attack corresponded with the date of a menstrual period, it would bear so close a resemblance to hæmatocele or non-encysted effusion, that the distinction would be all but impossible.

Fibrous tumours of the uterus, in addition to their history, would of course be recognised by their consistence and attachments. Retroversion of the uterus, by the direction of the uterine cavity, as indicated by the introduction of the sound, and fæcal accumulations in the rectum by their plastic character.

The reports of post-mortem examinations in cases of non-encysted blood extravasations into the peritoneum, are proportionally more numerous than those of encysted hæmatocele, inasmuch as the former much more certainly ends fatally. In the non-encysted extravasation, it was generally found after death that the skin of the body was devoid of colour, and the belly tumid, more particularly in the region of the hypogastrium. Black fluid blood escaped in considerable quantity when the abdomen was laid open. All the intestines were distended with gas, and pushed above the mass of blood contained in the pelvic cavity. The abdominal organs were often covered with clots; the intestines presented bluish stains, and in one instance the mesentery was infiltrated with blood. The amount of blood, fluid and coagulated, contained in the pelvis and abdomen, was repeatedly found to be as much as four pounds. The source of the hæmorrhage was traced to some distinct lesion in 16 out of 20 cases, and were proportionally as follows—viz., in 6 cases the hæmorrhage came from the ovary, in 4 from the rupture of an ovarian varix, in 2 from the cavity of the uterus, and in 4 from the Fallopian tube. In the remaining 4 no distinct lesion could be found, and it was supposed therefore that the hæmorrhage resulted from an exhalation of blood from the surface of the peritoneum itself.

In the post-mortem examination of patients who have died with retro-uterine hæmatocele, tumefaction of the abdomen was rarely met with. Commonly, the general surface of the peritoneum was healthy, except that occasionally adhesions were remarked between the intestines. If any of the adhesions forming the boundaries of the cyst had been torn, however, so as to allow any cyst contents to escape, the usual products of inflammation were found—redness and vascularity, lymphy exudations, purulent serum, with albuminous flakes. On a level with the brim of the pelvis the viscera were seen to be united together, forming the roof of the cyst. The bladder was ordinarily elevated above the pubis; the uterus close behind it, sometimes increased in size, and often rotated upon its axis to a position different from the usual one. Behind, adhesions united the posterior and superior aspect of the uterus to the rectum, a portion of the sigmoid flexure of the colon and several coils of small intestine, the two broad ligaments, and the posterior half of the circumference of the brim of the pelvis. A floor or roof was thus formed over the posterior half of the pelvic excavation. On laying open the cyst, the thickness of the walls of the cavity was found to vary with the amount of fibrinous exudation produced in each case. The cyst itself was divided into a number of compartments by cellular bands, but communications existed between the various loculi. All the pelvic organs were more or less fixed, the ovaries displaced and completely lost among the inflammatory products. If an opening had been effected previous to the decease of the patient, traces of ulceration were found, and the fistula between the aperture and cyst was sinuous and irregular. The contents of the cavity were sometimes clots more or less organized, sometimes a variable quantity of black fluid, greyish at certain points, and often like a mixture containing soot. Under the microscope, the contents were seen to consist of blood globules completely bereft of colour, and so altered in shape as to be scarcely recognisable. Besides these were fat globules, amorphous particles of hæmatoidine, various crystals, and other materials resulting from transformations in the effused blood. The displacement and confusion of parts seems to have been so great in consequence of the effused blood and subsequent inflammation, that the determination of the source of hæmorrhage in many cases was anything but satisfactory. No details concerning this are given under the head of "anatomical lesions," but as we have previously seen under the head of the Pathology of the Disease, M. Voisin has collected evidence sufficient to satisfy himself that the blood came from an ovary previously diseased in six instances of cystic hæmatocele, in two from the Fallopian tube, in one only from reflux of blood previously occupying the uterine cavity.

The treatment is considered under the heads prophylactic and curative; and the curative is divided again into surgical and medical treatment.

The author has little to offer in the way of suggestion concerning prophylactic treatment. Since it has been remarked that persons with varicose veins of the lower extremities, of the vagina, or rectum, have a proclivity to the affection, and that its commencement is in most cases preceded by painful and profuse menstruation, he recommends that, when these predisposing causes are present, all exciting causes should be sedulously avoided, particularly at the menstrual periods. Violent efforts of every kind, and excess of sexual intercourse, are to be proscribed; and entire abstinence from coitus during the occurrence of the catamenia, and indeed for some days subsequent to their disappearance, is to be insisted upon.

Non-encysted extravasations are, as a rule, so speedily and certainly fatal, that curative treatment may almost be said to be out of the question. Nevertheless, it behoves the practitioner to adopt any such measures as are likely to stay the flow of blood and avert the after consequences. M. Voisin states that we should not fear to bleed once or twice with this object in view; to apply cold compresses to the abdomen; sinapisms to the upper extremities; and that the patient should be kept perfectly free from all movement of the body, and every source of mental emotion.

In the curative treatment of cystic hæmatocele, the author is guided chiefly by the experience and opinions of M. Nélaton. It appears that at one time the learned professor employed the method of puncture or incision and evacuation in all cases indiscriminately. In several instances, however, where puncture was practised, the patients were attacked with purulent infection and died. This led to a modification of the rule previously followed, and artificial evacuation was resorted to only in certain urgent cases. M. Nélaton now teaches, that only when such symptoms are present as lead to a fear that rupture of the adhesions forming the parietes of the cyst, and subsequent extravasation of its contents, will take place, is surgical interference warrantable. Thus, where an hæmatocele already exists, and appears to be increasing in size, being attended by violent and constant pain, he concludes that inflammation is going on in the cavity, and that unless an opening be effected to lessen the distension, there is every probability that laceration of the cyst walls will take place, and a general and fatal peritonitis be the result. The propriety and safety of leaving less urgent cases to the curative powers of Nature will appear presently. An opening being determined upon, M. Nélaton performs the operation with a trocar and canula through the vagina. The patient being placed upon her back, the first and second fingers of the left hand being used as a guide, the right hand plunges the instrument into the most prominent portion of the tumour, and the trocar being withdrawn, the fluid escapes through the canula. Tepid water is afterwards thrown very gently into the cyst for the purpose of washing it out. On one occasion M. Nélaton injected iodine into the cavity, but the result was unfavourable. MM. Récamier and Velpeau made an incision with a knife in preference to using a trocar, and Professor Simpson advocates first an incision, and then the dilatation of the opening with the fingers, so as to ensure the breaking down and removal of the solid masses.

Of 20 cases collected by M. Voisin, where surgical interference was resorted to, 15 recovered and 5 died; contrasting these with the statistics of cases where no surgical operation was performed, the balance of results appears to be decidedly in favour of leaving the case to nature. Thus, out of 27 cases treated by the expectant method, 22 recovered and 5 died. Deducting from the deaths two, in which hæmatocele was apparently not the immediate cause of death, the mortality is reduced to 1 in 9, while in the cases where an artificial opening was made it stands as 1 to 4. Great as this difference may seem, it cannot be taken as overwhelming evidence in favour of leaving all cases indiscriminately to the curative powers of nature. In the first place, the statistics are far too limited to enable one to arrive at a sound conclusion, and there are probably sources of fallacy which do not lie immediately on the surface. This idea receives confirmation when we turn to Dr. West's lecture on Hæmatocele, and find there that in a number of instances almost equal to that of M. Voisin, the average number of recoveries after treatment by puncture was somewhat more than those in which the expectant plan was followed. Thus, out of 14 treated by the expectant plan, 11 recovered and 3 died; while out of 27 treated by puncture, 22 recovered and 5 died. It deserves also to be remembered as probable, that some of M. Voisin's cases treated by puncture, and which terminated in death, were instances of the worst form of the disease, and that an opening may have been deemed necessary on account of the severity of the symptoms by which they were attended.

We think, however, the author has adduced sufficient evidence to prove that many of the instances of retro-uterine hæmatocele require no surgical interference, and that an opening is justifiable only in the more urgent cases. The evacuation by puncture or incision is by no means devoid of danger, for in addition to the purulent affection which followed this practice in the hands of M. Nélaton, and which was the cause of his restricting the operation solely to the most urgent cases, a patient under the conjoint care of MM. Malgaigne and Nélaton, died from a wound of a posterior uterine artery; and a patient operated upon by M. Huguier died from peritonitis, provoked by the injection of warm water into the cyst for the purpose of washing out its contents.

The therapeutic indications to be fulfilled are, in the first place, to prevent a recurrence of the hæmorrhage; and in the second, to combat the results of the hæmorrhage—viz., peritonitis, swelling, and anæmia. In fulfilling the first indication, absolute rest is to be enforced, and the pelvis elevated. Cold applications are to be made to the abdomen, astringents given internally, and sinapisms applied to the upper extremities. For the treatment of peritonitis incident to hæmatocele, leeches to the anus or abdomen, calomel and opium, rapid blisters on the abdomen, and belladonna plasters, are recommended; warm baths are to be avoided. For the purpose of dissipating the tumour, emollients, blisters, derivatives, and absolute rest at the menstrual period. The anæmia is to be combated by preparations of iron, tonics, good diet, and proper hygiene.

Appended to the monograph are details of 36 cases of retro-uterine hæmatocele, which have been collected by the author, and an engraving which illustrates faithfully the arrangement of the viscera, and the appearance of the fibrinous adhesions around an intra-peritoneal hæmatocele.

We have thus followed the author through the various chapters of his volume, giving a summary of the most important points as they presented themselves successively. It only remains to recommend the perusal of the work to all who make the diseases of women their study, as deserving their careful attention.

REVIEW X.

1. *The Mineral Springs of Vichy. A Sketch of their Chemical and Physical Characters, and of their Efficacy in the Treatment of various Diseases.* (Written after a rapid sketch from Kissingen in the summer of 1858.) By A. B. GRANVILLE, M.D., F.R.S. 8vo, pp. 243.—*London*, 1860.
2. *De l'Emploi des Eaux de Vichy dans les Affections Chroniqûes de l'Uterus.* Par le Dr. WILLEMIN, Médecin Inspecteur-adjunct des Eaux de Vichy. 8vo, pp. 247.—*Paris*, 1859.

On the Employment of the Waters of Vichy in Chronic Affections of the Uterus. By Dr. WILLEMIN.

DR. GRANVILLE has endeavoured in the volume before us to show, that even Vichy may be made subservient to his favourite Kissingen, and that when treatment at the latter spa is not alone sufficient, the previous employment of Vichy waters may be resorted to with advantage; in his introductory chapter he says—

> "It turned out as I anticipated; once thoroughly acquainted with all the springs of Vichy—having tasted to satiety of all its waters, and luxuriated in its satinising baths—it was not difficult, whilst conversing with Dr. Barthes—looking over his statistical tables of diseases treated by those waters and baths—and listening to his lucid views of their mode of action (views most ably developed in his 'Guide Practique des Maladies aux Eaux de Vichy'), it was not difficult, I say, for me to come to the conclusion that, in certain maladies aptly the subject for mineral-water treatment, such as gout, rheumatism, dyspepsia, gastralgia, and others, the completement of the cure begun at Vichy with its *warm alkaline* waters, was Kissingen with its *cold acidulous chalybeate* springs—the Pandur, and, above all, the Ragozi; whilst in many cases of general debility, prostrated constitutions, weakened and chlorotic females, bloodless complexions forming a larger proportion of the invalids who properly seek renovation from the marvellous Ragozi, the supersaturation of the system, at times inevitable, by the acidulated oxide of iron, would be presently corrected and further improved by a course of the Grande Grille, or l'Hôpital."

Dr. Granville's work is more especially devoted to the description of the locality of Vichy, and the chemical characters and general therapeutic uses of its waters, without entering particularly into the treatment of any special disease; whereas in Dr. Willemin's volume, little is said as to the nature of the springs, but its pages are chiefly occupied with details illustrating the effects of the waters in the different affections of the uterus.

Most of our readers are probably aware that Vichy is a small town of France, situated in the department of the Allier, on the right bank of the river Allier, and is about two hundred and fifty miles from Paris, and that it is reached from that city by the Paris and Orleans, or rather Orleans and Lyons railway, the visitor stopping at a station named St. Germains des Fossés, and proceeding then to Vichy, a distance of about nine miles, by carriage or omnibus. The town may be divided into two parts, the old and new, the latter consisting principally of hotels and houses, which accommodate the visitors during the season, which lasts from the 15th of May, the day on which the bathing establishment opens, until the 15th of September, when it closes.

Vichy proper contains many mineral springs which are employed medicinally, and there are likewise several in the neighbourhood; the principal are the Grande Grille, Puits Chomel, Puits Carré, Source de l'Hôpital, Source Lucas and Acacia, Célestins, and Puits Lardy; and the neighbouring springs are those named Source des Dames and Hauterive. Some of these are hot, others cold; in the former category we find the Grande Grille, Puits Chomel, Carré, Hôpital, and Lucas; the temperature of the hot springs varies from 112° Fahr. to 84° Fahr.; of the cold spring the temperature ranges from 74° to 57° Fahr.

In composition the waters of different sources closely resemble each other, being strong solutions of bicarbonate of soda with small amounts of other salts, together with a notable quantity of free carbonic acid dissolved in the water; two of the above-named sources are likewise pretty strongly ferruginous. The amount of bicarbonate of soda is very equal in the different waters, and at the same time exceedingly great, more than thirty-five grains in each pint, and their activity doubtless is chiefly dependent on the presence of this salt, although probably influenced in some considerable degree by the other ingredients, amongst which may be found the following elements—chlorine, iodine, bromine, arsenic, aluminium, iron, silicium, boron, sulphur, phosphorus, potassium, magnesium, strontium, calcium, and manganese; these being in the form of salts, formed by the union of the different elementary substances.

From the most trustworthy analysis, it seems in the highest degree probable that the waters from all the sources are essentially the same in origin and composition, and that the slight differences found are due to what may be termed accidental circumstances.

What are the Vichy waters good for? is the heading to the seventh chapter; we will dwell a little upon this part of the work, as it is the portion of most interest to the physician.

It must be remembered that all the waters are strongly alkaline from bicarbonate of soda, in fact, with the exception of two or three springs, more alkaline than any other known sources in Europe; this alkaline condition must therefore exert considerable influence on their therapeutic virtues: another element which is found in several of the waters is the heat.

The question of the influence of the temperature of mineral waters being of some considerable importance, we shall make a short digression in order to discuss it. Our author says that temperature has much therapeutic influence, and brings forward in favour of this view the fact to which he affirms patients who have gone through a course of these waters can testify—viz., that waters chemically identical differ considerably in their therapeutical effects. Who among such patients, says our author, is prepared to deny that when they swallow a large draught of the Puits Chomel (a hot spring), they experience effects far different from those which the ingestion of an equal quantity of the Célestins (a cold source) produces? Yet in these waters the saline ingredients are the same; and why therefore are the ostensible effects to the drinker different?

> "Plunge the thermometer into each of these waters," says Dr. Granville, "and it will give you the key of the secret. You will read off the instrument 111° Fahr. for the first, and 56° Fahr. for the second. In fact, the one is hot, the other cold. Let the latter be made 111° by charcoal heat, and see if the ostensible effects of the *Puits Chomel* can be produced.
>
> "Now, this diversity of heat accompanying an identity of composition sufficiently accounts for the difference which the most expert medical practitioners in the place imagine and assert they have observed in the mode of action of the different sources; and I can readily believe it, since I have long been convinced that volcanic or central heat, besides being an agent acting *per se* on the human frame, is capable of modifying the action of the soluble substances with which it is associated in a mineral water. We should therefore expect different results in the employment of the *Grande Grille* from those of the *Puits Carré*—in those of the *Hôpital* from those of the *Lardy*—lastly, and still more glaringly, in those of the *Puits Chomel* from those of the

Célestins. Accordingly, all medical authorities I have consulted, and their respective works, agree in assigning to each source a distinct faculty in the treatment of particular disorders."

Dr. Granville considers that there are many circumstances which should be taken into consideration in estimating the value of particular springs and their efficiency in disease—circumstances which he thinks have been too much overlooked by the majority of medical hydrologists, the principal of these being a temperature more or less elevated—a greater or less quantity of gas in the water—the presence or absence of light, or much or too little of it—the state of the atmosphere as to heat and elasticity, and probably the evolution of electro-magnetic effects during some stages of the solution, the presence of which may become a modifying agent in the efficacy of a mineral water.

A question of some interest to determine, not only with reference to the Vichy, but likewise to many other mineral waters, is whether the different sources in the same locality possess specific virtues by which they can be distinguished from each other. Our author appears to believe that each spring has peculiar virtues, and in support of his opinion brings forward the opinion of some writers on Vichy and other waters, for he says:

> "Each source has some peculiarity of therapeutical and physiological effect which renders it preferable to the rest in the treatment of particular maladies or for the relief of especial symptoms. My knowledge of these facts, as applicable to Vichy, is derived from the report of several of my patients who have frequented the place for two or three seasons, and who have been very particular in noting their effect on their complaints."

Many authors, however, disagree in toto with this view of the subject, and in our opinion such is more consonant with our knowledge of therapeutics. Dr. Durand-Fardel holds this opinion, as also Dr. Kühn, quoted by our author, when he states:

> "Medical hydrologists, those more particularly who belong to certain spas, admit still, and with great complacency, the antiquated doctrine that each mineral watering-place is endowed with occult and specific virtues, that renders it suitable to certain distinct maladies; whereas the real state of the question is, not to ascertain whether such a water be specific against gout or rheumatism, or a uterine disease, or a complaint of the kidneys, but under what conditions of a certain given case of disease a certain mineral water is sure to be useful. Thermal medicine is a matter of appreciation and tact. A mineral water has no other value than that which a skilful physician knows how to elicit from it. To consider it as a medicament, prepared and supplied by nature for a single special object, is an error. Mineral waters are simple instruments in the hands of the physician, from which it is for him to obtain the most advantageous results."

We think that most of our readers must agree with the above remarks, and confess it would require a very large amount of evidence, far greater than has hitherto been brought forward, to convince us to the contrary. Yet when at Vichy we were gravely told, on going round to the different sources, the very statements quoted by our author, that the waters of the Grande Grille were chiefly useful in forms of difficult digestion connected with hepatic derangement; that those of the Célestins were most especially serviceable in cases of renal and vesical calculus, and certain forms of gout, acting particularly as a diuretic; whilst those labouring from chest affections were most benefited by drinking from the Puits Chomel and Carré.

With regard to the physiological and therapeutic action of the Vichy waters, the following is a summary, extracted from Dr. Barthez's observations, which are given at length by our author.

In quantities of twelve or fifteen glasses a day, and continued during thirty days or so, the Vichy waters have no very sensible influence upon the circulation; if anything, it is somewhat lessened. Sometimes a desire to sleep is induced; at times a slight feeling of excitement or species of intoxication. The appetite is usually increased and digestion improved; slight constipation rather than relaxation is apt to be induced. The urine is generally rendered alkaline in less than an hour after drinking the water, and remains clear and free from sediment of uric acid or urates. It is usually rendered in smaller quantities than the amount of water drank, which is accounted for by an increased action of the cutaneous function. The generative organs are commonly somewhat excited, especially at the commencement of the course.

If the waters be continued even in moderation beyond a certain time—say three weeks—atonic dyspepsia is often induced, with diminution of muscular strength, at the same time diarrhœa is apt to supervene, and other signs of irritation of the abdominal organs.

The action of the Vichy waters is evidently due to the large amount of bicarbonate of soda contained in them, which, when introduced into the system, renders the blood more than normally alkaline—a condition which diminishes the plasticity of the several constituents of that fluid, alters the characters of the various secretions and excretions derived from it, and likewise stimulates the different glands. Although the bicarbonate of soda be the chief active agent in these waters, we would willingly agree with Dr. Granville in thinking that the numerous other ingredients which are present in them in small quantities, add considerably to their power.

> "This effect of combination," he says, "is well seen in the difference of action between Püllna water and a simple solution of the principal salt contained in it. Attempt positive purgation by means of Epsom salts alone, you may be compelled to give an ounce of them. Drink a pint of Püllna water, the same purgative, and a more active effect will be produced with one-third of the above quantity of sulphate of magnesia, which the pint of water holds in solution. Why so? Evidently because there are sixteen other ingredients in that pint of Püllna water to help the Epsom salts it contains."

The eighth chapter is devoted to a description of the great thermal establishment at Vichy, which in all respects is of a first-class description. Dr. Granville says:—"At no other foreign spa (and I have visited a considerable number of them) are the appliances for bathing better than they are to be met with at Vichy." Our space will not permit us to enter into this subject, which will be found detailed in the volume; but we shall content ourselves with giving a short account of the effects produced by the administration of the water in the form of the bath.

The activity of the circulation is rather diminished than augmented; and, after many baths, more or less lassitude is often experienced, and sometimes nervous agitation induced. The function of the skin is commonly augmented, accompanied by an itching, and now and then a cutaneous eruption. The urine becomes alkaline, usually after a quarter of an hour's immersion; and the renal secretion is at the same time sensibly increased. The Vichy water is mostly employed diluted with an equal quantity of common water, sometimes even with more.

The ninth chapter contains matter of considerable importance—namely, the results which have been arrived at at Vichy in the treatment of certain diseases; and that considerable reliance may be placed upon these, it may be stated that they are derived from the statistics of the thermal military hospital at that place, obtained by Dr. Barthez, the chief inspector of these waters, who furnished them to our author; in reference to which we find the following passage:

> "I feel particularly indebted to Dr. Barthez for his courtesy and liberality in enabling me to give to my English readers this official return, which has nowhere been published, having been drawn up for, and despatched to the military authorities in Paris, at the conclusion of the season at Vichy last September. The Minister of War is in possession of a number of similar reports from Inspector Barthez, forwarded from year to year, in accordance with the rules of the military service. Their great merit is their minute precision and accuracy. No erroneous conclusions can be drawn from the perusal of such documents."

The diseases are classified under the eight following heads:—Diseases of the Digestive Canal—Diseases of the Liver—Diseases of the Spleen—Diseases of the Bladder—Gravel—Gout—Rheumatism—and Diabetes.

Under the first head, the diseases enumerated as having been treated are—chronic gastritis; chronic gastro-enteritic disease, and affections of the alimentary canal considered to be of a nervous character. In the chronic inflammatory diseases the number of patients was nearly 200; the number cured and much improved very large, and the failures exceedingly few. In the nervous cases, out of the number of patients treated, there were cured or greatly improved about an equal proportion.

On looking over these numbers, one cannot help remarking what might be called an anomaly—namely, the fact that the same treatment should prove effectual in diseases so different from each other in their intimate pathology. May not the cure in many of these cases be ascribed more to other circumstances than the exhibition of the waters? Certainly dilute alkaline solutions in this country not unfrequently augment functional dyspeptic affections, but it is not difficult to understand that many slight inflammatory conditions of the mucous membrane of the alimentary canal would be materially benefited by such treatment.

The class of Diseases of the Liver includes cases of simple inflammatory hepatitis, engorgement, induration, and obstruction of the liver; with a few cases of abscess of the organ, gall-stones, and the so-named hepatalgia. Between two and three hundred cases are recorded: the cures and marked improvements are numerous, failure is recorded but in few instances. The same remark applies to different forms of Splenic disease, often the result of attacks of African intermittent fever or other paludean agues.

In Vesical catarrh the recorded success is found to be very high, as likewise in uric acid gravel; in the latter, more particularly, we should expect such favourable results, seeing that the alkaline treatment as ordinarily pursued is for the most part attended with marked success.

Vichy waters have for some time enjoyed a considerable reputation in the treatment of Gout. Dr. Barthez gives the results obtained during the treatment of 135 patients suffering from this disease, and finds that the number of cures and apparent cures amounted to 69, 66 were improved, and only 9 experienced no appreciable amendment. In no case did Dr. Barthez observe any untoward accident from the use of Vichy waters. The largest interval of respite from the disease that has been observed in patients who have gone through the Vichy treatment has been four years, but its mean duration has been from fifteen to eighteen months.

In 80 cases of Rheumatism, 35 were considered to be cured, 31 improved, and in 14 no result was obtained.

Lastly, in 73 cases of Diabetes, it is affirmed that 32 lost the presence of sugar in the urine at the end of a few days of treatment, 30 obtained a more or less sensible diminution of the same, and 11 continued in the same state. To this statement it is very properly added, that of the 30 from which Dr. Barthez obtained information during the years subsequent to the cure, 7 showed after that time no appearance of sugar in the urine, but in all the others this principle had reappeared in that secretion.

From a survey of the above cases, as likewise of those given by other writers, more especially Drs. Charles Petit and Durand-Fardel, we should be inclined to regard the Vichy waters as powerful agents, often for good, but not unfrequently, if used indiscriminately, productive of much mischief; and we should feel disposed, not to question the accuracy of the statistics, but to consider the apparent results in many instances more favourable than the real. For example, let us take the last class of patients—the diabetic; is there evidence of any real therapeutic powers in the waters in this disease? Regulated diet alone will probably produce equal amendment; we know also, from personal experience, that in some cases where the sugar has been asserted to be absent from the urine of patients who had taken the Vichy waters, within a few hours this principle existed in fluid in considerable quantities. Again, in gouty cases, how common is it to find an interval of a year or more between the attacks, even when no special treatment has been employed. That Vichy waters do harm occasionally, we have likewise seen much proof; acting, as they do, as powerful lowering agents, and, if long continued, producing an impoverished state of the blood, and the consequent increase of organic mischief.

The tenth chapter is devoted to the diet, regimen, hygienic conditions, general and particular cautions and directions to be attended to by patients undergoing the Vichy treatment; but on these points we find little to detain us. There is a somewhat lengthened discussion about the use of acid fruits, and the arguments employed by some writers on these waters for their employment or prohibition, many of which are altogether false, inasmuch as it can be easily demonstrated, and it is a fact well known to most intelligent practitioners, that acids by no means necessarily render nugatory the action of alkaline remedies, inasmuch as the neutral salts thus formed with the vegetable acids are readily decomposed in the blood, and the alkali thus again set free, or reduced to the condition of a carbonate. There is an anecdote related of Professor Lallemand in this chapter with regard to the influence of certain fruits, not without interest, and which we will transcribe:

> "During his residence at the University of Montpellier, patients consulted him who laboured under slight irritation of the digestive organs, for which, by way of refreshing aliments, Lallemand usually recommended the use of strawberries. To his great astonishment, a few days after, the greatest number of these patients came to report to him that they passed the strawberries they had taken with their urine. Manifestly impossible as the phenomenon was, Lallemand had the curiosity to ascertain the nature of the alleged fact, when he discovered that the presumed red pips of the strawberries were nothing else than round grains of uric acid deposited at the bottom of the vessel in the form of gravel."

The eleventh and twelfth chapters are chiefly devoted to matters more interesting to visitors of the Spa than to the majority of our readers, relating as they do to the hotels, public amusements, excursions, and so on. Our opinion of Dr. Granville's work, derived from a careful perusal of its contents, may be thus summed up: It is written in an easy and agreeable style, and most of the contents are well fitted for the perusal of patients about to visit Vichy, as the volume possesses much matter of general interest.

The medical information contained in the work is limited, and not derived from personal experience, but from the works of former writers on these waters, and from conversations with physicians and others in the locality. Its pleasing style and the character of its contents will recommend it to a large class.

Our space will not allow us to go into any detail in speaking of the contents of Dr. Willemin's work, nor are they such as can be conveniently discussed here, consisting as they do chiefly of details of cases; we may, however, give a short summary of the results which, from his experience, he has arrived at, recommending to those of our readers specially interested in the treatment of such cases the careful perusal of the volume.

Dr. Willemin considers that in chronic engorgement of the uterus connected with anteversion or retroversion, the treatment of Vichy possesses remarkable efficacy; he also recommends it in chronic metritis, although in the latter case it may be necessary, before having recourse to the waters, to combat the inflammation by appropriate antiphlogistic remedies. In cases of peri-uterine inflammation, the Vichy treatment was like-

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wise found successful; and in several cases where sterility appeared to have depended on a retroversion of the uterus, impregnation has occurred after the use of the waters. In suppressed menstruation also the discharge was frequently re-established, especially when the obstruction was dependent on uterine engorgement.

The treatment in most cases consisted, not only in the internal administration of the waters, but the application also in the form of the general bath, as well as the *bains de piscine* and the use of *irrigations* during the bath. We must, however, again refer to the work itself for much that is interesting on this subject, and in taking leave of it remark that the observations of cases, which are very numerous, appear to have been made and recorded with great care and faithfulness.

Review XI.

Foundation for a New Theory and Practice of Medicine. By Thomas Inman, M.D., Member of the Royal College of Physicians, London; Lecturer on the Principles and Practice of Medicine; Physician to the Liverpool Royal Infirmary, &c.—*London*, 1860. pp. 374.

The above title will sound, no doubt, to most of our readers, as it does to ourselves, not a little startling. A new theory and practice of medicine! Πόποι θεοὶ! What can we suppose but that the author is going to introduce us to a new pathy or system which he has devised? Not so, however; he aims solely

> "To show that there exists in medicine a fundamental principle, by undeviating attention to which our science may surely attain that general position and esteem which, though it has always claimed, it has never yet enjoyed."

Truly a most laudable aim, and one for which, if successful, he must claim a pre-eminent statue in the temple of science. To learn and fully acquaint ourselves with this fundamental principle must henceforth be our prime duty. All past teaching, information, and experience we have gained must henceforth be subordinated to this fundamental rule; on this foundation we must build, or we must not build at all. Surely our readers are all impatience to hear what this principle is; what is this new spirit that is to *inform* the hitherto "rudis indigestaque moles" of medical knowledge. It will be fairest to the author to let him state this for himself, which he does in his summary of propositions, pp. 349–352. In the last he says:

> "Lastly, and it is this conclusion which has induced us to give the title we have done to this essay—That the theory and practice of medicine ought to be based upon alteration in *power* or vital *force*, rather than in changes of *structure.*"

We read and re-read this, and somehow we cannot divest ourselves of a persuasion that the idea is not altogether new; that we have heard, and read, and acted on something not very dissimilar to this principle before. Perhaps we are mistaken; let us see. In speaking of the treatment of inflammation, Dr. Watson warns us that it is not every case that warrants the abstraction of blood; that its power is great for evil as well as for good, and that we must consider carefully a variety of different circumstances before we decide upon it. The degree of pyrexia, the quality of the pulse, the importance of the organ affected, the intensity of the inflammation, the stage of the disease, the age, sex, and general condition of the patient, and the ordinary character and course of the disease when occurring epidemically, are all to be taken into account. Now, all or most of these involve the consideration or estimation of power and vital force. The one condition which, with certain exceptions, is in Dr. Watson's view "our lawful warrant for general bleeding" is hardness of the pulse. But we cannot think of this sign without reference to the contractile force of the heart and arteries on which it depends. The sign is to us an index of the state of the vital force in at least one most important organ. Again, he puts strongly the great difference between the pneumonia of influenza and the acute sthenic in regard of their fitness for venesection. In the former, bleeding was borne exceedingly ill; in the latter, he has no sort of hesitation as to its utility and necessity. Here is a clear putting aside of structural change, and preference of the condition of the general power as a guide to treatment. Dr. Copland writes in the same strain: that

> "A hard, tense, or strong pulse not only requires a very copious depletion at first, but generally also a repetition of it;" while, *per contra*, "it may be taken as a general rule, that when the pulse is above 110 and compressible, whatever may be the organ inflamed, the system will not bear bloodletting even in the first instance."

Again:

> "Inflammations consequent upon active excitement, or attending vital reaction, are most benefited by that measure, whilst those caused by septic, poisonous, infectious, or contaminating agents, are generally aggravated by it. All the depressing affections of the mind, an air loaded with malaria or paludal exhalations, the foul air of hospitals, and the confined atmosphere of large towns, particularly in crowded dwellings, in low cellars, in close lanes or alleys, and in manufactories, frequently not only prevent the good effects of bleeding from ensuing, but also render its institution or repetition injurious."

Can there be any clearer recognition of the importance of regarding power or vital force than the above? So again, speaking of antimony:

> "The most successful results frequently follow it in delicate constitutions, where bloodletting does not promise any decided advantage. It should not, however, be carelessly employed, as I have seen it productive of the most injurious effects when pushed far in debilitated persons and in young children."

Dr. Elliotson, speaking of the circumstances that forbid free bleeding, enumerates extraordinary debility of the pulse, feebleness of the constitution, tender years, extreme old age. What is this but forming a due estimate of vital power? At the close of a clinical lecture on asthenic pneumonia, Dr. Corrigan impresses on his hearers the following points: 1st, That the name of a disease is not an index to its treatment; but that, on the contrary, under the one name the pathological conditions of the organ affected may change so much as to require the most varying or even opposite mode of treatment. 2ndly, That pneumonia presents an illustration of this principle, as it may be of a sthenic or an asthenic form. 3rdly, That the disease may be asthenic from the commencement. 4thly, That quinine in large doses is a remedy of great power over the asthenic form of pneumonia, whether it be primary or secondary. Dr. Gordon in Dublin, and Russell in Birmingham, have both observed and written on the same affection. Surely these men looked more to the state of the general system, to alterations of vital power, than to changes of structure. Would any practitioner dream of treating a case of typhous pneumonia in the same way as a case of simple? Says Dr. Alison:

> "We know, from experiments on animals, that inflammation with all such consequences (*e.g.*, in the eye) may be produced, if not merely by inanition, at least by causes acting on a very exhausted system, and producing this effect by reason of the exhaustion; and that all may be removed merely by giving sufficient nourishment; and therefore we can easily understand, what experience abundantly demonstrates, that not only the antiphlogistic remedies after a time must be discontinued, but the antiphlogistic regimen relaxed, even sometimes at the risk of temporary aggravation of part of the disease, in such cases; and that the best effects should result from the gradual introduction of a tonic regimen, from country air, exercise, moderate mental excitement, and a gradually improved diet. Such cases illustrate strongly the mischief which may be done by practising for the names of diseases, and forcibly remind us of the judicious aphorism of Boerhäave: 'Nullum remedium in morbis cognovi, quin solo tempestivo usu tale fiat.'"

Does Dr. Inman think that Dr. Alison did not give a prominent place to the consideration of vital force? But we fear we shall weary out our reader's patience if we quote more to the same effect, otherwise we could go on almost *ad infinitum.* We would especially commend to Dr. Inman's attention the writings of Mr. Tyrrell, where he will find in almost every page injunctions to attend carefully to the state of the general power, to avoid depressing it, or to raise it by food and tonics if it has already become impaired. No one was more thoroughly alive to the truth that no remedy could have a beneficial effect unless the system as a whole was duly supported. Case 6, p. 24, is one which we are sure Dr. Inman will read with pleasure, if he is not already familiar with it. The following remarks from the pen of Mr. Critchett are so much to our present purpose that we cannot pass them over. He says, speaking of certain cases of iritis:

> "In these the constitutional power is at a low ebb, and evidences of a strumous diathesis often coexist. It is found that although such cases are distinctly traceable to a syphilitic taint, mercury, even though administered so as to affect the system fully, so far from controlling the disease, seems on the contrary to increase the effusion of lymph. We learn two important points in practice from these exceptional cases—the one is that adhesive inflammation produces its worst results, and its most rapid and extensive effects, in feeble and broken constitutions; and the other, that mercury may, and frequently does, act rather as a poison to the system than as an antidote to the disease, and may thus actually aggravate that condition which it was administered to remove, and which with a less debilitated frame it would have cured. How,

then, are we to manage these embarrassing and anxious cases, seeing that the disease is proceeding with extreme and even fatal rapidity, and that our usual sheet-anchor fails us? It will be found that even these exceptional cases confirm the rules, and that mercury does not fail because it has lost its power over the disease, but because the constitution is in too low and irritable a condition to bear its administration. Our first effort, then, must be to build up the powers in every available manner. In the face of the acute disease, we must administer tonics, stimuli, and a liberal diet; and as our patient gains strength mercury may be carefully insinuated into the system in such a way as to produce the least possible amount of irritation, and with this view I have found mercurial inunction the best method. As it begins to affect the gums it will be seen that the constitution now bears that which before irritated and depressed it, and that the disease subsides under the same medicine which, administered at an earlier stage too freely and in an unfavourable state of the system, only aggravated every symptom."

Here is surely full proof that Dr. Inman's recommendation, his fundamental principle, is nothing new, but just what many of our best authorities have taught and practised for years past. Thus far, then, we feel compelled to aver of Dr. Inman's teaching, that what it contains, if *true* is not *new*. Let us next see what is to be said of the *new* that we find in it. In the paragraph succeeding the one in which he enunciates his principle above discussed, he proceeds as follows—

"We may sum up our idea of the correct principle of treatment thus:—In the early stage of any disease, when fever is present, the mildest medicines are the best, as the condition is a natural one, essential to the complaint, and having in previously healthy persons a constant tendency to abate after a definite period; under no circumstances should means be adopted to cure this fever, which would of themselves suffice to make a healthy man seriously ill. As soon as the intensity of the symptoms subsides, and before the fever itself has gone, the plan of treatment is to be entirely changed. One day may be given to ascertain the condition of the vital power, and the direction it is taking; after that, the physician will encourage the restorative powers of the system with medicinal or hygienic dietetic agents until health is restored. Special diseases require special plans of treatment, yet the preceding principle is applicable to all."

We believe we do not misrepresent the author when we say, that we take him to mean in the directions above given, that all decidedly lowering and depressing treatment is to be avoided; in fact, that in the early period of disease the position of the medical man is to be simply expectant. In his preface he speaks even more plainly, he poses such questions as these—

"Does bleeding lessen the force and frequency of the heart's action? and if so, is the patient better in consequence? Will not the force and frequency diminish without venesection being practised? Again, if mercury bridles the adhesive inflammation, does it not promote suppurative or destructive? . . . . Why must adhesive inflammation be bridled at all? Cases of antimonial poisoning are now rife: why does the doctor, who would swear a man's life away for administering this drug to his *healthy* wife for the purposes of murder, use the same material in even larger doses when people are ill from pneumonia?"

The tone of the book throughout is in the same strain; the author professes his admiration of Dr. Bennett, of Edinburgh, and exempts him alone from his condemnation of all other writers, in whose works he thinks there is an absence of all trustworthy principles. At page 79 alone we find some lines which sound very differently. It is there admitted, that a doctor may take blood, give calomel, antimony, and the like, "all of which have a direct tendency to diminish the vital force." He is to use these means only for a short time (who would do otherwise?) "and if by the use of them he is enabled to restore the normal condition of any organ, the disease of which threatened to cut short life, they become converted into direct conservators." Had Dr. Inman given this a prominent place among his conclusions, and made it largely to qualify his fundamental principle, we should have had nothing to say, except that he certainly could not have professed to lay the foundation for a new theory and practice of medicine. But we cannot admit that a few lines in one page alter the general bearing of the work, with which we must therefore deal according to its pretensions. Dr. Inman evidently aims at effecting a great reform, and we cannot see what that is to be, if it does not involve the almost entire abandonment of lowering, antiphlogistic treatment. From the "idea of the correct principle of treatment" above quoted, it seems to us pretty clear that Dr. Inman has little or no fear of reaction ever being excessive; he does not entertain the notion that a local inflammation can be maintained or aggravated, or carried on to suppuration, by excessive action of the heart and a full state of the circulating current. We concede that at the present day, and in this country, we rarely meet with cases in which pyrexia is so great as to demand any considerable evacuation or lowering treatment for its relief; or in which we find it needful to use more than moderate measures to reduce the active state of a local inflammation. In a multitude of cases a very mild exhibition of drugs, or perhaps mere withdrawal of all exciting and sustaining causes of disease, such as may be had by repose in bed and a restricted diet, is quite sufficient to ensure a subsidence of all acute symptoms.

But we contend, and shall endeavour to prove, that there are cases occurring at different periods, more or less numerously, in which the reverse is the case, where an expectant treatment is most mischievous, as allowing most serious damage to take place, with the result of either protracted illness or a fatal issue. We must take leave to postulate that we have a full right to accept the records of experience given us by those who from their position, character, and opportunities seem to us worthy of credit. Dr. Inman asks us to accept his statements of his own experiences, and we do so cordially. What he tells us as a fact that he has witnessed, we entirely believe. But we require in return that he do the same by us and by those authorities we quote. He cannot have the vanity to think (we are sure) that his knowledge, judgment, or good faith are greater than those of various men we shall cite. If he objects to this, all authority and past experience must be rejected, his own included, and every one must go for himself on his own personal observation. We take up Abercrombie, and turn to the chapter on the treatment of inflammatory affections of the brain. It seems to us impossible to read these cases and not feel convinced that symptoms of the gravest kind, and such as can only be attributed to congestion or inflammatory action, were removed by a severe antiphlogistic treatment, such as we suppose Dr. Inman would absolutely condemn. In Case 74, improvement did not appear till a second venesection of twenty ounces, the first having been twenty-eight ounces. In 7 out of the 13 cases, mention is made of the recovery having been speedy, and we have no ground in common fairness to conclude that any serious debility was produced. Dr. Elliotson, writing in 1831 on phrenitis, advocates copious and repeated venesection, antimony, colchicum, and mercury to salivation. He says:

> "You will often find the disease give way to mercury as soon as the mouth is tender. I have seen this in dozens—I might almost say *hundreds* of instances. Bleeding did good to a certain extent only, but as soon as the mouth became sore, away went the pain."

He relates the case of a young woman who was seized with intense giddiness without any pain; she was plethoric, and as her pulse justified bleeding, she "was twice depleted very copiously, and by that simple means, together with purging, she got completely well." Yet in the very next paragraph he goes on thus:

> "It is to be remembered, however, that all these affections (whether there be an inflammatory state of the head, or inflammatory headache, or simple vertigo) may depend upon an opposite state of the brain. I have seen several cases of chronic pain of the head, which have resisted all anti-inflammatory treatment, but which gave way very speedily to the exhibition of iron, quinine, or other tonics, and to full diet. You can only judge of these things by observing not only how long the case has existed, but that the pulse is feeble, and that stimulating the patient does not make him worse."

Is not this evidence that Dr. Elliotson more than twenty-five years ago was aware of the need for discriminating between sthenic and asthenic head affections, and did so, and treated them accordingly? and shall we presume to say that both he and Abercrombie were deceived in their estimate of the former cases, and that they recovered not in consequence of, but in spite of the treatment? Dr. Copland, in his article on inflammation of the brain and its membranes, fully endorses Dr. Elliotson's statements; and Dr. Alison, in his 'Outlines of Pathology and Practice,' writes quite to the same effect. Were they all so blind that they could not see whether a mode of treatment was beneficial or not?

Coming down to a later period, we find Dr. West, a most careful and accurate observer, in his work 'On the Diseases of Children,' advocating decidedly in inflammatory affections of the head, depletion, general and local, purgatives, mercurials, and the application of cold; "and these must be used with an unsparing hand if we would have any chance of saving our patient." Let us take another life-threatening disease—*croup*. Cheyne, Watson, Copland, Alison, West, are all as one in favour of a prompt and energetic employment of bloodletting, general and local, tartar emetic, and calomel. Must we suppose all these eminent authorities to have been mistaken, and to have employed these active lowering and reducing measures needlessly, if not injuriously? It is very true that our own experience in croup does not encourage us to hope for much success from this practice—on the contrary, after a fair trial of ipecacuan in emetic and nauseating doses, we should not delay to tracheotomize. But we should consider ourselves most presumptuous if we arraigned on this ground the practice of others who have obtained different results. We know far too well how "varium et mutabile" disease is, to be surprised that our experience should not correspond with that of others. On the other hand, we have several independent testimonies from men of ampler observation to the good effect of energetic antimonial or calomel treatment.

Dr. Inman does not use antimony—at least, he has only given it once in seven years of hospital experience, and then it did good; but he has seen patients fearfully depressed by it, and one bronchitic patient died in twelve hours—of the disease or the remedy is not said. Besides this small experience of his own, all he has to bring against antimony is the testimony of Dr. Boling, U.S.A., who has seen almost as many die of *over*-dosing with antimony as of pneumonia. We italicize the *over*, for this physician has not abandoned the use of antimony, but only gives a smaller amount—viz., three grains in twenty-four hours instead of six, and finds this equally efficacious. We think him judicious—more so than Dr. Inman, who rejects a remedy approved by so many and so eminent observers on such very small grounds.

Lest Dr. Inman should imagine we can only see with the eyes of others, and are blind followers of routine, we subjoin a brief record of two cases of sthenic disease treated by antimony. A carter, aged twenty-seven, was admitted on the fifth day of his illness with the physical signs of pneumonia, and bloody expectoration. Pulse weak, frequent; skin warm; lips livid. Large turpentine stupes were ordered, and ant. pot. tart., half a grain; liq. opii sedat., five minims; inf. calumb., one ounce; tertiis horis. The next day he was much relieved, and the expectoration was no longer bloody. Pulse 100; respiration 46. Two days later, the dose of antimony was doubled, and the next day the pulse was down to 75 and the respiration to 27, the day before having been 93 and 40 respectively. The next day the medicine was given only four times a day, and the day following it produced continual nausea for the first time, and was omitted, convalescence being fully established. The physical signs of pneumonia had almost entirely disappeared on the ninth day of treatment. It is of much significance in this case that the physiological effects of the remedy did not appear, or very slightly, until the disease had terminated. What else can we think of this fact, except that the system was at first in a morbid (unnatural) condition, which prevented its normal reaction against the drug from taking place, and that when this condition ceased, the usual effect occurred? Whether the marked improvement which ensued on doubling the antimonial dose was owing to the increase of the remedy, or to the spontaneous subsidence of the disease, we do not decide. So far at least is clear, that decided improvement had taken place before, and that the patient was not one whit worse for the remedy in the larger doses.

Dr. Parkes notices the sudden occurrence of improvement in severe cases (such as this), about the ninth or tenth day, which about corresponds to the date of the marked fall in the pulse and breathing. He also (though he has ventured to trace the course of a case of acute sthenic pneumonia limited to the left side, without any treatment) is "firmly persuaded that we have it in our power materially to modify the course and shorten the duration of pneumonia by the judicious employment of bloodletting, leeching, tartar emetic, certain salines, and opium."

Case 2.—A female, aged eighteen, ill a few hours with urgent symptoms of acute laryngitis, and getting worse, though she has had eight leeches to the throat. Can scarcely speak; lies with head thrown back; lips rather dusky; is somnolent, but uneasy and restless. Ordered ant. pot. tart., one grain; aquæ, half an ounce, every half-hour; calomel, one grain every hour, about ten P.M. The next morning she was much easier, and expressed herself so. Pulse 120, soft; respiration 48, short, much less stridulous; lips of good colour. She had taken twelve doses of the antimony, when she became so prostrated, that the medicine was omitted. It was continued now in half-grain doses every two hours, with the calomel hourly. In the night, eight leeches had been applied to the neck. The next day, pulse 112, respiration 34; mouth sore; distinct vesicular respiration in both backs; calomel omitted. Next day, pulse 100; respiration short and irregular; but she was quite easy and free from dyspnœa. Antimony left off last evening. About fourteen days after she was discharged quite well. No possible doubt can exist that the bold exhibition of antimony alone saved this woman from impending death.

In contrast to the preceding, we record the following:—Male, aged forty-five; ill fourteen days; complains of catarrh and oppression of breathing; a considerable amount of effusion was discovered in the left pleura, displacing the heart; skin cool; pulse weak. For the first ten days he had tinc. ferri mur. and tinct. digitalis, with two blisters to the side. As debility was still more marked at the end of this time, he was put on carb. ammon., Hoffman's anodyne, and cascarilla; to which ol. morrhuæ and some morphia were added three days later, and soon after, carbonate of iron and manganese. After nearly two months' treatment he was discharged in good health, with a very tolerably efficient left lung.

The following case of eye disease is to the same effect:—A male, aged sixty, applied on March 24th; ill five days with acute sclero-conjunctivitis; great pain, and serous chemosis of left eye. There was a marked deposit of yellow pus in the anterior chamber. He was treated for three days with calomel and opium, after a purge, and had lotion to the eye. The chemosis diminished, but the hypopion and the hyperæmia remained unchanged. Quinine and iron were then given in pretty full doses, and in a week the pus had been absorbed, and in another the eye was almost well. It is by no means certain in this case that the calomel and opium was not useful, though it did not act directly curatively, yet we believe it prepared the eye for the tonics, which given at first, might very possibly have increased the irritation. We cite these cases to show that we are no more wedded to antiphlogistic than to tonic treatment.

Let us pass on to an important abdominal organ, the liver. What shall we say would be good practice in a case of acute hepatitis, such as occurs in tropical countries? Shall we quietly stand by, and administer only "the mildest medicines," while the acute inflammation is rapidly running on to abscess? or shall we let blood freely, locally and generally, and purge with calomel and James's powder, &c.? Mr. R. Martin, whose authority, we presume, Dr. Inman will not reject, shall answer. "The greatest danger indeed will be found in feebleness, irresolution, and in do-nothing plans." Again,—

> "The medical attendant must remember that the subsidence of local symptoms, together with a declared and satisfactory abatement of all the general symptoms, including that of the force and frequency of the circulation, and a permanent relaxation of the skin, with freedom in the secretions, can alone warrant the discontinuance of antiphlogistic means, including the most spare use of farinaceous food and drink."

In noticing a case of almost latent deep-seated inflammation of the liver, he says:—

> "The patient was young and of robust habit, so that with the loss of about eighty ounces of blood in the first twenty-four hours, followed by calomel and antimony, gently to affect the gums, strong purgatives, and total deprivation of food, he rapidly recovered; but I think he recovered with difficulty; a few hours more lost to the treatment, and it would have been too late."

Again, if we take dysentery, we find the same author stating his experience and that of many others in no uncertain language.

> "It will be found with dysentery as with fever, that a sufficient abstraction of blood by venesection, practised at the very onset of the disease, will simplify and render easy all the subsequent stages of the cure; so much so that in mild and uncomplicated dysentery, as in the violently acute and inflammatory type of the disease, bloodletting is the primary as well as the cardinal measure."

Calomel and sudorifics in full doses are to be exhibited to the youthful and robust. He gives the warning—

> "That a speedy and secure convalescence results from a timely, well-regulated, and decisive course of treatment; while chronic dysentery, with lingering sufferings in hospital or permanently broken health, will follow on feeble and indecisive attempts at cure."

Yet he adds, with wise circumspection,—

> "It is impossible to fix an arbitrary rule or gauge for every case beforehand, and . . . . . in our management of an ever-varying disease, we are unable to lay down any catholic rules of treatment, which shall be suitable to every case."

Would it not be well if Dr. Inman were as willing to believe that there may be another side to the view of treatment besides that of expectancy and tonics, which he so exclusively contemplates? Once more we would ask Dr. Inman's attention to what Dr. Copland has written on the subject of inflammatory fever (article Fever, p. 930), and to his directions for the treatment.

> "*During excitement*, and especially at its commencement, vascular *depletions* should be practised and carried as far as the state of the pulse and other circumstances will permit; . . . it should not be overlooked that in the intense climate fever vascular depletions should be prompt, from a large orifice, large, and repeated, to be successful; and that the quantity of blood abstracted should depend chiefly upon the effect produced. Dr. Jackson justly remarks that it should be taken in quantity sufficient to relax the surface and set free the secretions. Less than three pounds is rarely sufficient to produce this effect; and six have not been more than sufficient on some occasions. In these (the most severe cases), vascular depletions, aided by the other means appropriate to this state, ought to be most energetically practised; for nothing else will save from fatal changes taking place within the brain, or from as fatal exhaustion and its effects."

Lastly, we must call in evidence the recorded experience of Dr. Gooch, as given in his treatise on peritoneal fevers. He seldom or never saved the patients if the disease had been going on two or three days; wine and egg, and diffusible stimulants, were almost signals of a fatal termination.

> "The active treatment (venesection, leeches, purging), that which will determine the fate of the patient, should be begun and ended during the first day; when employed later, it is under great disadvantages, and with very diminished chances of success."

If early used, however, it generally arrested the disease. The whole of Dr. Gooch's statements are too long to extract, but they should be carefully perused, for they prove clearly that he approached the treatment of the disease with no preconceived notions, and that the conclusions he arrived at were the legitimate results of careful and continued observation. No one, we think, can read his paper, and not feel convinced that the measures he employed were most appropriate to the kind of disorder which came under his observation. No future experience, we conceive, can alter the meaning and value of the facts he has left on record. They prove to our mind beyond a doubt that acute puerperal peritonitis for several years together may be of such a type as to demand imperatively prompt and energetic antiphlogistic treatment for the preservation of life. Cases V. and VI. (pp. 31–33 of the New Sydenham Society's volume) show that Gooch was no blind routinist, that he ever studied nature, and could discern cases requiring depletion from those which would have been injured by it.

> "This case led me a step further than the former; it taught me that a lying-in woman might have diffused and permanent pain and tenderness of the belly, with a rapid pulse, from a state which does not require bleeding, and is not relieved by it, but which is speedily relieved by fomentations and opiates."

It scarcely seems necessary to adduce any further evidence to show that the author's teaching, in so far as it is *new*, is *untrue*, and we must say, dangerously and mischievously untrue. As disciples of Dr. Inman, when in presence of the early acute stage of a life-threatening disease, we are to abstain carefully from depressing measures, and only to administer "the mildest medicines;" because, as he states in his twenty-third conclusion, a plan of medication which does nothing to depress the vital power is practically superior to one that does depress it. On this teaching we must stand by, and quietly look on at the acute stage of croup, till the febrile conditions begin to subside, when we are set to work to restore the powers—*if our patient is not meanwhile beyond our reach!* The great and palpable error which underlies all Dr. Inman's arguments and reasonings is this—that he has never admitted the possibility of febrile reaction or inflammatory exudation being *themselves* the cause of death. He evidently thinks that we can always afford to wait, and let the inflammation do what it will; and then, when it is subsiding, come in with restoratives, &c. Now, this may do very well with asthenic forms of disease, many of which, as well known, will bear a strongly stimulant and supporting treatment from the very first; but we cannot understand a man of the most moderate experience and acquaintance with medical literature insisting that such a proceeding is universally applicable, and proposing to erect on this foundation a new theory and practice of medicine.

In thus plainly and frankly criticising Dr. Inman, we are quite aware that every word we have written applies almost or quite as fully to the late eminent physician, who left as the legacy of his mature experience, conclusions closely resembling those of our author. Dr. Todd stated, in his last volume of lectures, (1) That the notion so long prevalent in the schools, that acute disease can be prevented or cured by means which depress and reduce vital and nervous power, is altogether fallacious; (2.) That acute disease is not curable by the direct influence of any form of drug, or any known remedial agent, excepting when it is capable of acting as an antidote, or of neutralizing a poison on the presence of which in the system the disease may depend. For an answer to the first, we refer his followers to the experience of those who have seen acute sthenic disease in the tropics; to such a case as the one of laryngitis we have above recorded; to Mr. Bevan's cases of scalds of the larynx, recently published in the 'Dublin Quarterly Journal of Medical Science;' and to Gooch's paper quoted above. *If in any single case death has been manifestly averted, and the patient's life saved by the free use of depressant measures, Dr. Todd's dogma must fall to the ground;* and the only further question remaining, is how to diagnose and select the cases to which such a treatment is appropriate. All are agreed that antiphlogistic treatment must not be indiscriminately used, that it is powerful for evil if abused, and that at the present day and in this country there is not often need of more than a sparing application of it; the only difference is, that the reformers assert it is never useful in any case, while the older school maintains that at certain times and places cases are not unfrequent where its employment is all-essential. To Dr. Todd's second proposition we object the following instances, which might be greatly multiplied. 1. That it is a matter of pure hypothesis to state that ague is cured by quinine because it neutralizes the malarious poison, or acts as an antidote to it; there is not a shadow of evidence in favour of such a view. In fact, the repeated relapses of aguish patients after apparent cures, the occasional failure of quinine, its success in non-malarious neuralgia, all show that it is no antidote or neutraliser; but that it acts on the tissues, especially the nervous, strengthening and toning them to resist the poison, which remains as before in the system, perhaps for life. If ague and neuralgia were to be cured by natural processes, and not by the direct influence of drugs, would it not be sufficient to feed and alcoholize the patients well, and sweat them thoroughly. 2. What is to be said of the marvellous curative action of potassæ chloras on buccal inflammation, mercurial or idiopathic; and what reason have we to think it neutralizes or eliminates any poison? Further, we must notice one so *grave erreur* in Dr. Todd's statements, that we utterly marvel he could have committed it. He writes, that the much vaunted powers of mercury to promote the resolution of inflammation, and to cause the absorption of its product, lymph, rests upon a false analogy between syphilitic iritis, in which he admits its powers, and other forms of exudative inflammation. Was Dr. Todd really ignorant that mercury will cure idiopathic or traumatic iritis? Did he not know that it will also cure orchitis, whether from gonorrhœa or injury? We cannot help protesting against his overlooking two such patent facts in his condemnation of mercury as a remedy for inflammation.

We have thought it right thus to notice the accordance of Dr. Todd with Dr. Inman, as in the matter of authority materially strengthening the latter's position. We must look upon both as followers, though thoroughly independent ones, of Dr. H. Bennett, whose well-known paper first set on foot the present controversy in our day. And to give every one his due, it must be allowed that whatever merit belongs to these three, the priority to a great extent, in this country at least, must be assigned to Dr. Dickson, the apostle of chronothermalism, who has long reviled antiphlogistic proceedings, and lauded a treatment essentially supporting. We do not know whether our friends will be pleased *stare sub nominis umbrâ*, but it is certainly true that Dr. Dickson long ago asserted much the same as what the two English physicians teach.

But to return to the author's work: Chapter VIII. contains twenty-two histories of apoplectic, or threatening apoplectic cases, which were more or less relieved (at least most of them) by tonic measures, and the inference is, that as degeneration is the result of debility, it will be accelerated by anything which reduces still further the vital power—consequently, venesection and purging. It is fully granted that, as before shown by Dr. Todd, in cases of white softening, or supposed white softening, a tonic regimen may be most useful; but to generalize from this, and to suppose that in all cases of brittle cerebral vessels we shall do good by such a proceeding, is surely not very apparent. Will tonics make an old man's vessels elastic after they have become brittle from earthy deposit? We trow not. But they may with wine and full feeding increase his mass of circulating blood, and excite the heart's action, and so increase the strain upon the vascular walls till rupture takes place. Indian officers tell how a copious epistaxis has saved life during the dangerous period of a remittent fever with cerebral determination. Dr. Inman goes on to apply his view of debility as the essence of the malady to cases of "water in the head." He says:

> "When this was looked upon as indicating inflammation and increased action, the plan of treatment was necessarily depressing, and antiphlogistics formed the staple resource. A very short experience and reasoning from analogy led me to believe this treatment was totally wrong, and I was led to adopt a plan entirely of an invigorating character. The result has been well marked; instead of finding hydrocephalus now to be a fearfully formidable disease, I find it quite as tractable as any other strumous affection, and the mortality to be not more than about ten per cent. This has been brought about, first, by recognising threatenings of brain disease at an earlier stage of the complaint than was formerly considered possible; secondly, by paying strict attention to the smallest departure from health; thirdly, by avoidance of all depressing remedies, especially purgatives; and fourthly, by using steel, change of air, and other tonics."

He gives some imperfectly recorded cases, but we must confess that we desiderate further evidence of his ability to cure ninety per cent. of tubercular meningitis. Chapter XI. is principally taken up with descriptions of the structural alterations in atheromatous and brittle bloodvessels. The capillaries easily fracture, and have their walls thickened, sometimes to such a degree as to contract their canal considerably.

Chapters XV.–XIX. contain much in the way of interesting discussion, and suggestive remarks on the administration and use of medicines, on the influence of exercise, the means for restoring vital power, counter-irritants, &c. In much of what the author advances we cordially agree, but we think he frequently falls into the error of representing some evident absurdity as a generally received and sanctioned practice, which needs to be exposed and denounced. He lays it down, for instance, that exercise *per se* is prejudicial, and it does good only when it promotes an appetite which can be allayed by sufficient food, and produces a vigorous circulation of blood in air sufficiently pure to ensure a perfect aeration of that fluid in the lungs. This is somewhat strained, but taken fairly, what is it but a caution against the abuse of exercise? Now, surely medical men are not in the habit of recommending feeble patients to walk or ride beyond their strength. In fact, the cases must be rare where the patient would attempt it. On the other hand, the instances are numberless where weakly people do not, cannot, or will not take exercise enough, but to whom the effort, if made, would be most beneficial. Take an example: the writer is a member of a volunteer corps, and gives the time to drill once or twice a week which used to be spent in post-prandial repose, reading, or dosing. Though it has often required some resolution to set out, he has been surprised to find that he has actually returned from drill and a three-mile walk fresher and less weary than when he started. Several other members of the corps have also remarked the invigorating effect of the exercise, though at the end of a day's toil. There is no doubt that sufficient rest, especially for the overworked, is all-important, but mere rest will never impart strength, or give tone and vigour to the system. The remarks on counter-irritation are well worth perusal, and open a new view of an old subject. The benefit produced by blisters and the like is referred to absorption of the vesicating material, and its stimulating effect on the tissue which is in a state of chronic inflammation. He believes that "counter-irritants of all kinds are physiologically incompatible with low diet, antimonials, purgatives, or other depressing remedies, inasmuch as it is manifestly absurd to stimulate locally and yet depress generally." In the last chapter, the author, boasting of the improved mode of treating phthisis in the present day, says—

> "We see that phthisis was looked upon as a disease to be conquered; just as we looked upon the sepoys rising in rebellion, it was attacked by every material in the medical armoury. Bleeding, mercury, low diet, emetics, setons, issues, moxas, blisters, incisions, creosote, iodine, tar, and a host of other things were tried, generally and locally—with what results we know."

This we hold to be a very unfair representation, and take leave to doubt whether we have made any such great advance in the treatment of the disease as Dr. Inman would have us believe. Dr. Elliotson, writing thirty years ago, says, the great mode of preventing phthisis, when there is a predisposition to it, is by invigorating the body as much as possible. Sydenham, though setting too much store by bleeding and purging, probably from inability to distinguish sufficiently between tubercular and common inflammatory disease, has yet left his recorded opinion as follows—"The primary remedy is daily riding on horseback, which is all in all. Do this, and you may neglect the rules of diet, and deprive yourself of no sort of meat or drink." Similarly unjust is a statement we read in a note at p. 156—"At present *the curing of all diseases by drugs, the lancet, blisters, leeches, &c. is orthodox*, but a time is coming, the sooner the better, when this will be considered as heterodox as we think the ancient meddling surgical practice was." We think it a great pity that Dr. Inman should allow himself to write in such a strain as the words italicized above, which he surely cannot seriously mean to affirm as expressing the fact.

Our limits warn us to close, but we would not part from the author without the assurance, that though we have felt it our duty to criticise freely the errors into which he seems to us to have fallen, we are also quite satisfied that there is much in his work that the reader will peruse with profit and advantage. He is evidently a working man, and an independent and original thinker. He has already rendered good service to the profession by his writings on myalgia. Twenty years hence, when he has read and seen more, he will give us another edition of his work which will better justify the title he has chosen than the present. In the meantime we commend to his consideration, and theirs who are disposed to think with him, the old story of the two knights who fought about the gold and silver shield. Disease is neither all and always sthenic, nor asthenic, but is ever tending more or less towards the one or the other, according to the *constitutio anni*, the subject, the climate, the locality, and various other influences. If we confine our thoughts to our own limited range of observation, we shall inevitably form narrow and one-sided views; but if we take as wide a range as possible, we shall see truth under various aspects and forms, and our conceptions will become larger and more correct.

As a last word we will allude to M. Trousseau's article, 'Médication Antiphlogistique,' in his work on Therapeutics, which we earnestly commend to Dr. Inman, if he is not already familiar with it. We have the very highest opinion of the talent and skill of this physician, and believe his views come as near as possible to the truth. They strongly corroborate those of our best authorities at home.

Review XII.

1. *A Practical Treatise on the Diagnosis, Pathology, and Treatment of Diseases of the Heart.* By Austin Flint, M.D., Professor of Clinical Medicine, &c., in the New Orleans School of Medicine; Visiting Physician to the New Orleans Charity Hospital, &c. &c.—*Philadelphia*, 1859. 8vo, pp. 473.
2. *Physical Exploration and Diagnosis of Diseases affecting the Respiratory Organs.* By Austin Flint, M.D.—*Philadelphia*, 1856. 8vo, pp. 636.

In 1852, after the appearance of his 'Clinical Report on Continued Fever,' we first became familiar with the name of Dr. Austin Flint. During the eight years which have since elapsed he has fairly acquired the title of an ardent as well as successful cultivator of medical science. And we question the fact of any recent American author in our profession being more extensively known, or more deservedly esteemed in this country, than Dr. Flint. The works—neither of them on a small scale—whose titles are placed at the head of this article, testify to Dr. Flint's indefatigable labours as an author; they have been written, moreover, as he informs us in a preface to the first work, "amidst the cares and distractions of active medical practice," and while successively discharging the duties of a Clinical Professor in no fewer than three of the American medical schools. When we first heard of Dr. Flint he was at Buffalo. In 1856, Louisville was the scene of his labours; before 1859 he was translated to New Orleans. Where shall we find Dr. Flint when his next work appears? Both of the treatises are designed "to meet the wants of the medical student" as well as of the practitioner; while Dr. Flint has further "striven to make" the works "as practical as possible," treating the various topics "with almost exclusive reference to their direct clinical bearings." We willingly acknowledge his success, more particularly in the volume on diseases of the heart, in making an extended personal clinical study available for purposes of illustration, in connexion with cases which have been reported by other trustworthy observers; and we hail with pleasure this work, as that of an author who is attempting to follow in the direction of Dr. Stokes, whose admirable volume on the same subject has unfolded to us the rich treasures which may be accumulated by the competent and careful observer. Dr. Flint, wisely as we think, does not in this volume concern himself with anatomical and physiological discussions concerning the heart,—not that these are unimportant, but because they are not embraced within the scope of a work which professes to be occupied with diseases of the heart alone. Plunging at once *in medias res,* we have the first of Dr. Flint's ten chapters occupied with enlargement of the heart (hypertrophy and dilatation); the second with lesions, exclusive of enlargement, affecting the walls of the heart (atrophy, fatty growth and degeneration, softening, induration, aneurism of the heart, and rupture). The third chapter is devoted to lesions affecting the valves and orifices of the heart, while the fourth includes the diagnosis and treatment of such diseases. Chapter fifth treats of congenital misplacements, defects, and malformations of the heart. In the sixth, the nature of some important and very interesting affections is discussed, such as formation of clots and fibrinous coagula within the cavities of the heart, polypi, angina pectoris, enlargement of the thyroid gland, and prominence of the eyeballs, reduplication of the heart-sounds. Chapters seven and eight relate to the inflammatory affections of the heart (peri-, endo- and myo- carditis). Functional disorders form the subject of the ninth; while diseases of the aorta, and thoracic aneurisms, are appropriately considered in the tenth and last chapter. This division of contents is, if not altogether satisfactory, convenient enough, while the amount of material for consideration is sufficiently ample. On some of the more interesting, selecting particularly the more novel subjects, we shall allow Dr. Flint to address our readers; while, at the same time, we take the liberty of assenting or demurring to his opinions, according to our already determined purpose.

Regarding the first chapter, we shall only remark that it offers a very intelligible account of the nature, diagnosis, and treatment of cardiac hypertrophy and dilatation.

In the second chapter, when discussing "fatty growth and degeneration," we find the "arcus senilis" described as a "fatty degeneration of the iris" (p. 98), though it is quite evident that Dr. Flint, familiar as he is with the import of this phenomenon, and aware of all that has been written regarding it, more especially by Mr. Canton, of London, and his own countryman, Dr. Benjamin Lee, believes the cornea to be the seat of the peculiar change. We advert to this point to express our entire agreement with the author when he affirms, regarding the arcus senilis—

> "With our present knowledge, it is certainly insufficient as a basis of the diagnosis of fatty degeneration of the heart, exclusive of local signs and symptoms; and, on the other hand, its absence is not to be considered as proof that the cardiac affection does not exist."

In the treatment of fatty heart, as of other forms of fatty degeneration, Dr. Flint, very prudently, as we think, interdicts the exhibition, not only of fatty substances, but also of all principles which are readily transformed into fat. His criticism on the statement of a writer, "who believes that he has seen cod-liver oil combined with steel followed by very satisfactory results in supposed cases of fatty degeneration of the heart," is eminently suggestive, and therefore we append it: "It should be clear that the results were due to the oil, and not to the steel and other measures; and also, that the disease was fatty degeneration, in order to base thereon the propriety of this remedy." For our own part, the more we see of the employment of cod-liver oil as a remedy, the more convinced do we become of the truthfulness of Dr. Williams's observation, that its best effects will only be produced in those who are able to take exercise, specially exercise in the open air. This, patients unequivocally affected with fatty heart, are scarcely in a position to do. We should not, therefore, be disposed to trust to cod-liver oil as a serviceable remedy in such cases.

In the third chapter, which is devoted to lesions affecting the valves of the heart, we find some interesting observations on arterial obstruction by fibrinous deposits detached from the valves in orifices of the heart. This subject, one of very great importance, has only of late years received any amount of attention, and is as yet very far from having attracted the careful study it deserves. To Professor Virchow of Berlin, Dr. Kirkes of London, and Dr. Simpson of Edinburgh—to whose name, by the way, Dr. Flint does not refer—we are mainly indebted for the information we already possess. To the detached deposits or migratory plugs Virchow has given the name of *emboli* (from the Greek verb ἐμβάλλω, to throw in); these may, however, be found elsewhere than in the heart—in the arteries or veins; and from the latter they may be carried to the heart, and thence into the branches of the pulmonary artery. When formed in the heart, it is in the great majority of instances on its left side; valvular lesions on the right being very infrequent, and consequently it is in the arteries of the systemic circulation that the emboli are chiefly found. Obstruction of one or other of the cerebral arteries in this manner, leading to paralysis and circumscribed softening of the brain, is probably of by no means rare occurrence.

In the same chapter, when treating of hæmoptysis as a symptom of valvular lesion, we find Dr. Flint observing that

> "Of the different lesions, mitral contraction is most likely to give rise to bronchial hæmorrhage. It occurs, however, by no means exclusively in connexion with this form, but is observed in cases of mitral regurgitation, and also in connexion with lesions at the aortic orifice."

In this observation we entirely concur; the most profuse hæmoptysis connected with cardiac disease we ever remember to have witnessed, and accompanied (as post-mortem examination revealed) by pulmonary apoplexy to a very considerable extent, occurred in a case of aortic insufficiency, in which the mitral orifice remained unaffected.

The remarks in the fourth chapter on the physical signs, diagnosis, and treatment of valvular lesions are full and comprehensive. We find nothing, however, calling for any very special animadversion.

In the succeeding chapter, Dr. Flint is too brief on the subject of Polypi of the Heart. The only author referred to is Grisolle; the important observations of Rokitansky, Pigray, Bouillaud, Dr. Hope, Dr. Stokes, and many others, are not alluded to. To judge from an interesting paper in the 'Edinburgh Veterinary Review' for January, 1860, by Mr. Arthur Gamgee, this peculiar morbid formation is not unknown in the lower animals.

We have perused with pleasure our author's remarks on that peculiar combination of symptoms, affection of the heart with enlargement of the thyroid gland and eyeballs; and we are glad to find that a disease so interesting in its nature is at length attracting the attention it deserves. Within the last year, two highly valuable memoirs relating to this disease have appeared; one in the Danish language, entitled 'On the Cachexia Exophthalmica of Authors,' published originally in the 'Bibliothek for Laeger,' the author being Dr. Withusen. For a translation of this able paper we are indebted to Dr. Moore, of Dublin, an erudite scholar as well as accomplished physician. In three numbers of the 'Dublin Medical Press' for 1859, Dr. Moore's translation will be found. The other memoir to which we refer is contained in two numbers of the 'Archives Générales de Médecine (November and December), under the title, De l'Exophthalmos Cachectique; it is from the pen of M. Fischer, *interne des hôpitaux.* The last-named writer adopts, we are sorry to find, without the slightest acknowledgment, the view originated by Dr. Begbie, that the morbid phenomena are all in the first instance dependent on anæmia.

In the seventh and eighth chapters we have a very able and complete view of the inflammatory affections of the heart. As bearing upon a very important subject, and one at the present time much and keenly debated, we shall quote Dr. Flint's observations on the employment of bloodletting in the treatment of pericarditis.

> "The practical questions are, Under what circumstances is bloodletting indicated? and, What are the contraindications to its use? A person in fair health and vigour attacked with pericarditis as an idiopathic or a rheumatic affection, is a proper subject for bloodletting at the outset of the disease. Resorted to under these circumstances it will not cut short the disease, and perhaps not abridge its duration; but it may contribute to diminish the intensity of the inflammation, and thus, without risk of injury, not only afford immediate relief, but lessen the evils and the danger, proximate and remote, which are involved in the disease. The amount of blood to be detracted must be determined by the constitution, habits, &c., of the patient, the symptoms referrible to the circulation, and the immediate effects upon the vascular system. Whether the bloodletting shall be general or local, or both, is to be determined mainly by the quantity of blood which it is deemed desirable to withdraw, and the comparative convenience of venesection and cupping or leeching. It is difficult to conceive of any important difference between these different methods as regards their effect on the disease, except so far as concerns the rapidity with which the blood is removed, and the amount detracted. The benefit derived from bloodletting will be evidenced by relief of pain, greater freedom of breathing, diminished force and greater regularity of the heart's action. These, then, are the circumstances which may indicate bloodletting—viz., the disease, idiopathic or rheumatic, occurring in a patient previously

healthy and tolerably vigorous; the inflammation recently developed, or, in other words, the disease being in its first period; and to these is to be added a certain degree of intensity or acuteness of the inflammation, as manifested by pain, development of the pulse, &c. The indications based on these circumstances are present in a certain proportion of cases of pericarditis. The contraindications, however, are present in a larger proportion of cases. (p. 340.)

Under the head of Pericardial Adhesions we find some interesting and judicious observations as to the diagnosis and the effects of adherent pericardium. The views of Bouillaud, Hope, and Stokes are referred to; and in further illustration of the subject, the recent memoirs of Dr. W. Gairdner and Dr. Kennedy of Dublin are commented upon.

The eighth chapter, relating to Endocarditis specially, is one of the best in the book. The observations it contains on diagnosis, general and physical, of valvular lesions being particularly full and accurate.

Functional derangements of the heart are discussed in the succeeding chapter. The observations on Thoracic Aneurisms, in the last chapter, are excellent, so far as they go, but too brief.

The work of Dr. Flint which has received this short notice at our hands, in connexion with his other volume, whose title we have placed at the head of our observations, may be regarded as constituting a complete guide to the diagnosis of diseases of the chest; and for this purpose we have much pleasure, and every confidence, in recommending them.

Review XIII.

The Transactions of the American Medical Association. Vol. XI.—*Philadelphia*, 1858. pp. 1023. Vol. XII.—*Philadelphia*, 1859. pp. 722.

This eleventh volume of the 'Transactions of the American Medical Association,' besides the minutes of the annual meeting, the president's address, and other matters usual in such publications, contains the following papers:

1. **Report on the Medical Topography and the Epidemic Diseases of Kentucky.** By W. L. Sutton, M.D., Georgetown, Kentucky.
2. **Report on the Topography and Epidemic Diseases of New Jersey, and the Treatment thereof.** By Lyndon A. Smith, M.D.
3. Report of the Committee on the Epidemics of the Ohio. By George Mendenhall, M.D.
4. **Report of the Committee on Medical Literature.** By A. B. Palmer, M.D.
5. **Report of the Special Committee on Medical Education.** By James R. Wood, M.D.
6. Report on Spontaneous Umbilical Hæmorrhage of the Newly-born. By J. Foster Jenkins, M.D., Yonkers, N.Y.
7. Report on Influence of Marriages of Consanguinity upon Offspring. By S. M. Bemiss, M.D., Louisville, Kentucky.

8. Report on the Functions of the Cerebellum. By E. ANDREWS, M.D., Chicago, Illinois.
9. Report on the Treatment best adapted to each Variety of Cataract. By MARK STEPHENSON, M.D., Surgeon to the New York Ophthalmic Hospital.
10. Report on the Medical Jurisprudence of Insanity. By C. B. COVENTRY, M.D., Utica, N.Y.
11. Report on the Law of Registration of Births, Marriages, and Deaths. By EDWARD JARVIS, M.D., Dorchester, Massachusetts.
12. Report on the Nervous System in Febrile Diseases, and the Classification of Fevers by the Nervous System. By HENRY FRASER CAMPBELL, A.M., M.D., Professor of Anatomy in the Medical College of Georgia.
13. Report on Moral Insanity in its Relations to Medical Jurisprudence. By D. MEREDITH REESE, M.D., LL.D., &c., of New York.
14. Report on Stomatitis Materna. By D. L. M'GUGIN, A.M., M.D., Keokuk, Iowa.
15. Report on the True Position and Value of Operative Surgery as a Therapeutic Agent. By J. B. FLINT, M.D., Louisville, Kentucky.
16. A Method for Preserving Membranous Pathological Specimens. By R. D. ARNOLD, M.D., of Savannah, Ga.
17. Letter of E. D. Fenner, M.D., to Paul F. Eve, President of the American Medical Association.
18. Prize Essay: The Clinical Study of the Heart-Sounds in Health and Disease. By AUSTIN FLINT, M.D., Buffalo, N.Y.
19. Prize Essay: Vision, and some of its Anomalies, as Revealed by the Ophthalmoscope. By MONTROSE A. PULLEN, M.D., of St. Louis, Missouri.
20. Plan of Organization of the American Medical Association.
21. Code of Ethics of the American Medical Association.

It would not be possible within our limits to give a separate notice of all these papers, nor indeed would it, under any circumstances, be necessary so to do, for several of them are very much of the nature of elementary treatises, and others of compendious reviews, sufficiently judicious and useful in their statement and examination of recognised facts and opinions, but affording little scope for analysis or criticism; several, also, are of too little general interest to demand especial attention.

Dr. Sutton's Report on the Medical Topography and Epidemic Diseases of Kentucky contains much information on the civil, military, and ecclesiastical history of the State, which the writer considers as a necessary introduction to the medical portion of the paper, but which, though interesting in itself, appears to us to be rather out of place. There are ten statistical tables, showing the relation of the mortality from cholera, dysentery, fever, scarlatina, and hooping-cough, to the number, age, sex, and colour of the population. These are useful in their kind, and must have cost considerable labour in their construction; but there seems to be nothing particular in connexion with them which need detain us.

A long account is given of one of those strange epidemics which have at different times visited the world, and which have been associated under the general denomination of "dancing mania." The particular outbreak here described is designated as "The Jerks; or, as it has been called, Epidemic Epilepsy." The account of it is derived, not from a medical source, but from "'The History of the Presbyterian Church in Kentucky,' by the Rev. Robert Davidson, who had collected the facts detailed by many writers who were personally connected with them, and who differed widely among themselves as to the character and causes of these affections." (p. 110.) It agrees in the most essential particulars with the descriptions of other similar epidemics. It commenced in 1799, and prevailed for several successive years.

There is a form of endemic disease which, as far as we know, has hitherto been observed (or at least described under the designations here given to it) only in North America, and there chiefly, if not exclusively, in the States of Alabama, Indiana, and Kentucky. It affects both man and cattle, being named in the former "milk-sickness," "sick-stomach," "swamp-fever," "pucking-fever," &c.; and in the latter, "the trembles." The most common name, milk-fever, is derived from the popular notion that the disease is caused in the human subject by drinking the milk of diseased cattle, or eating their flesh, in which latter case it would be better entitled to the appellation of "beef-fever," which, however, it does not seem to have obtained. The "trembles" in cattle are generally ascribed to some deleterious article of food, which has been thought by some to be the Rhus toxicodendron; by others, the arsenic derived from iron-pyrites introduced with food or drink; by others, the vegetable products of soils abounding in astringent salts, or the drinking of water holding such in solution. Dr. Sutton does not profess to have had any experience in the disease; but weighing at considerable length the evidence adduced by several observers, he leans to the opinion of those "who think it of malarial origin; and that between the trembles in animals and milk-sickness in man there is no such relation as cause and effect." (p. 143.) Viewing the evidence, like himself, without the light of personal experience, we should be disposed to coincide in this opinion. He introduces an account of the milk-sickness communicated by Dr. James H. Barbour, of Falmouth, Kentucky, which, though written in haste, appears to be to the point. Dr. Barbour thinks that the disease is clearly

> "A congestive or malignant remittent, in which the stages are so blended from the beginning, or become so during its course, as to assume the appearance of continued fever." (p. 124.)

He says further:

> "I have never met a physician who could make a clear distinction between what he calls milk-sickness and what he calls congestive fever, or what is commonly known as malignant fever." (p. 131.)

We have read with interest the Report on Medical Literature by Dr. Palmer, and that on Medical Education by Dr. James B. Wood. The former contains a full enumeration of the original works on medicine recently published in the United States—the translations and republications of foreign works, transactions of societies, reports of asylums, periodical publications, &c., together with many judicious comments on the present state and tendencies of medical literature; in the latter, many excellent suggestions are thrown out for the improvement of medical education, for which it would appear there is very considerable room. Though fully aware that medicine, in the totality of its study and practice, is less advanced in the New than in the Old World, we were certainly not prepared for the very low state of medical education which is candidly confessed to in both these reports; and we learn with surprise that comparatively few American physicians possess a knowledge of the French, German, or Italian languages. We should have thought that now-a-days almost every physician in the civilized world understood at least French.

The paper by Dr. Jenkins, on Spontaneous Umbilical Hæmorrhage of the Newly-born, contains a very elaborate and comprehensive review of the subject—the most so, we believe, of any hitherto published. It is chiefly a compilation. One hundred and seventy-eight cases collected from various sources, have been subjected by Dr. Jenkins to careful comparison and analysis, and digested into a table which exhibits at one view every particular of importance respecting them.

With regard to the etiology of this affection, it will be found, as might be expected, that it is for the most part merely a local exemplification of that singular hæmorrhagic diathesis which has been so frequently observed—sometimes arising from causes which elude inquiry, at others, from a morbid state of the blood connected with the presence of bile in that fluid, and which is so familiar as to have given rise to a general caution respecting the application of leeches in cases of jaundice.

In respect to the prognosis in cases of umbilical hæmorrhage, Dr. Jenkins says—

> "This is fearfully grave. Five-sixths (83·7 per cent.) of those attacked succumb to the disease, or its sequelæ (149 out of 178). Though umbilical bleeding be stayed, the child often dies of exhaustion, or by reason of the severity of the constitutional disease, of which the bleeding was only symptomatic. Complication with jaundice is perhaps the most serious; as we have seen, it is the most common association; 43¼ per cent. of all the cases observed (77 in 178) are known to have manifested icteric symptoms, and of those so affected 93½ per cent. (72 in 77) died. On the other hand, while but 7·7 per cent. (6 in 77) of those having jaundice recovered; of all those recovering, 79⅓ per cent. (23 in 29) had no jaundice. Purpura, which, as we have seen, is, in nearly one-half of the cases of jaundice complicating umbilical hæmorrhage, associated with it, is of equally grave import, denoting a want of plasticity in the blood. The cases most likely to recover are those of the healthy children of healthy parents, having no dyscratic taint, in whom jaundice or purpura are not seen, and in whom hæmorrhage has only come on after the separation of the cord." (p. 317.)

In respect to treatment, it will be found from the table, that a majority of the recoveries took place under the use of compression, sometimes associated with astringents or styptics; but Dr. Jenkins remarks that the greater part of these cases presented no signs of jaundice, purpura, or constitutional dyscrasia. Where such morbid conditions are present, he says that it is useless to rely on compression, or styptics, or cauteries, actual or potential; that ordinary hæmostatics are of little benefit, even if they do not, as sometimes happens, increase the bleeding; that the nitrate of silver is unquestionably injurious, except when combined with pressure; that filling the umbilical depression with fluid plaster of Paris, as recommended by Dr. Churchill, has succeeded in three cases, but is not generally to be depended upon; that cutting down upon the bleeding vessels is an operation which has never been performed with success, and one attended with considerable danger on account of the hæmorrhagic tendency present in such cases; but that great encouragement has hitherto been afforded by the adoption of the ligature *en masse*, as recommended by M. Paul Dubois. (pp. 316–17.)

On the important subject of "the influence of marriages of consanguinity upon offspring," Dr. Bemiss brings together a large amount of information. It is to be understood that a great part of the cases referred to as "marriages," are simply cases of sexual intercourse between blood-relatives.

The following are a few of the more striking facts arrived at by Dr. Bemiss's inquiries:—

Of 31 children born of brother and sister, or parent and child, 29 were defective in one way or another, 19 were idiotic, 1 epileptic, 5 scrofulous, and 11 deformed.

Of 53 children born of uncle and niece,* or aunt and nephew, 40 were defective, 1 deaf and dumb, 3 blind, 3 idiotic, 1 insane, 1 epileptic, 12 scrofulous, and 14 deformed.

Of 234 children born of cousins, themselves the offspring of kindred parents, 126 were defective, 10 deaf and dumb, 12 blind, 30 idiotic, 3 insane, 4 epileptic, 44 scrofulous, and 9 deformed.

Of 154 children born of double cousins, 42 were defective, 2 deaf and dumb, 2 blind, 4 idiotic, 6 insane, 2 epileptic, 10 scrofulous, and 2 deformed.

Of 2778 children born of first cousins, 793 were defective, 117 deaf and dumb, 63 blind, 231 idiotic, 24 insane, 44 epileptic, 189 scrofulous, and 53 deformed.

Of 513 children born of second cousins, 67 were defective, 9 deaf and dumb, 5 blind, 17 idiotic, 1 insane, 6 epileptic, 15 scrofulous, and 9 deformed.

Of 59 children born of third cousins, 16 were defective, 3 deaf and dumb, 1 idiotic, 1 insane, 2 epileptic, and 10 scrofulous.

The report on the functions of the cerebellum by Dr. Andrews is a well-written paper; the object of which is to prove from comparative anatomy that the lateral, or more properly the posterior, lobes of the cerebellum preside over the muscular motions of the posterior, and the median lobe over those of the anterior extremities.* In support of this theory he presents the following propositions :—

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* We have here substituted *niece* for *aunt*: the latter word, we presume, must have crept into Dr. Bemiss's table by mistake, since no sense can be made of the statement as it there stands.

> "1. In the warm-blooded animals, the median lobe, or vermiform process of the cerebellum, varies in size directly as the bulk and power of the anterior group of muscles.
>
> "2. The lateral lobes vary in like manner as the power of the posterior group of muscles; subject, however, to certain variations hereafter to be mentioned." (p. 430.)

He illustrates these propositions by eighteen figures, exhibiting successively the human encephalon, that of the gull, of the dolphin, of the mandrill, of the mole, of the rat, of the red-haired bat, of the house-mouse, of the silver-haired bat, of the snowy owl, of the great kangaroo, of the angouti, of the wild rabbit, of the porcupine, of the two-toed sloth, of "a small Saurian found in the Western States," of the moccasin, and of the turtle.

The general conclusions at which he arrives are the following :—

> "1. The division of the cerebellum which we have been considering, is traceable from the reptiles up to man.
>
> "2. The typical position of the lateral lobes is posterior to the median.
>
> "3. The median lobe has some function connected with voluntary motion, and its influence is expended chiefly upon the muscles of the anterior half of the body.
>
> "4. The lateral lobes exert a similar influence over the muscles of the posterior half of the body, and they are also in some way connected with the mental functions, inasmuch as they are developed to a certain extent in direct ratio with the intelligence of the animal.
>
> "5. The *nature* of the influence exerted by the cerebellum upon the muscles is not very clear. Although it may be true that through it the mind co-ordinates the muscular action, yet that is *not* true which is stated by Carpenter and others upon the subject—viz., that the size of the cerebellum is in a direct ratio with the number and variety of co-ordinated movements which the animal is capable of exercising.
>
> "Within the limits already explained, the size of the cerebellum is *directly as the quantity and power of muscular fibre to be moved*, with no regard whatever to the simplicity or complexity of their combinations. Thus the co-ordinated actions of a squirrel are far more numerous and varied than those of a dolphin. A mouse co-ordinates more than a bat; a rat more than a bird; a cat more than a seal; a sloth more than a sheep; yet in these, and in a hundred other instances, the animal which co-ordinates least has the largest and most complex cerebellum—the ratio being as the bulk of muscle to be used, and in the case of the lateral lobes, partly as the grade of the intelligence of the creature. It seems to me, therefore, that while it may be true that the mind, through the cerebellum, co-ordinates motions, it does not do so because it possesses a specific function of co-ordination, but simply because its action is directly excito-motor, and the mind, through it, can select any muscle or set of muscles it may choose for action." (p. 442–3.)

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* Or, as Dr. Barclay would have called them, *sacral* and *atlantal* extremities. It is, we think, to be regretted that the nomenclature proposed by this excellent anatomist, or some one constructed on similar principles, has not come into more general use. It would obviate many ambiguous, and some absurd, modes of expression. Having no reference to the erect or prone position of the body, it is equally applicable to man and to quadrupeds in all positions.

It should be observed that in the present memoir the writer confines himself to the evidence derived from comparative anatomy, reserving pathological and experimental proofs till another opportunity.

Dr. Campbell's report on the nervous system in febrile diseases may be regarded as a pathological work of considerable merit and importance, evincing a large extent of information, much thought, and patient and impartial investigation. It should be viewed in connexion with the 'Partial Report on the Nervous System,' and the 'Prize Essay on the Excito-secretory System of Nerves in its relations to Physiology and Pathology,' both contained in the tenth volume of these Transactions, and written by the same author as the paper now under review.

Three propositions laid down in the 'partial report,' are made the basis of Dr. Campbell's reasoning. They are as follows:

> "1. As all the normal phenomena of the living organism are known to occur under the superintending influence of the nervous system, and are dominated by it, so it is but rational to regard all morbid actions as being more or less influenced in their manifestations by *aberrated* nervous action. In that class of diseases ordinarily designated fevers, our researches and observations have led to the confident belief that the above law applies with sufficient prominence to constitute the basis of their classification, and we would here respectfully claim for it, that it is the only *reliable* basis of their classification; and further, that in its more extended application it will hereafter be found to constitute what may be called *par excellence* the *Law of Febrile Diseases.*
>
> "2. As in the nervous system we recognise two grand departments—viz.: 1st, The cerebro-spinal system, all the normal actions of which are of a continuous and *un*interrupted character, so in the manifestations of febrile diseases, do we distinctly recognise two grand distinguishing characteristics, respectively typifying the *normal* actions of these two systems of nerves; thus, a character of *paroxysm* obtains in certain cases, while a character of continuousness as plainly marks others.
>
> "3. Again; as in the cerebro-spinal system, we find that its normal action pertains almost exclusively to sensation and to motion, with only a secondary and comparatively somewhat remote influence (which we have termed excito-secretory) upon nutrition and secretion; while in the normal action of the ganglionic system, the entire function is known to be, to preside over nutrition and the secretions; so in *paroxysmal fevers*, do we find intense pain, modified sensation, and symptoms allying them to neuralgic and convulsive diseases very prominent, while in *continued fevers*, modified nutrition and altered secretion are the marked and most prominent characteristics.
>
> "We would therefore announce as our classification of febrile diseases, two grand divisions of fevers, corresponding with the two grand divisions of the nervous system; thus:
>
> "I. *Cerebro-spinal Fevers.*—All paroxysmal. The secretions and nutrition only *secondarily* affected.
>
> "II. *Ganglionic Fevers.*—All *continued.* The secretions and nutrition *primarily* affected." (Vol. x. pp. 457–8.)

It should be observed that the writer, in contending for the influence of the nervous system in the immediate production of the phenomena of fever, does not in the smallest degree exclude that of the blood as the vehicle of the poison, which may be their primary exciting cause. He remarks justly, that, "However acceptable and truthful any neuropathic theory of fevers might appear when considering a particular *assemblage* of phenomena, still there were ever presented certain other phenomena which involved the invokement of some humoral or chemical dogma to complete the philosophical consistency of the doctrine, and in its turn each of these last, when exclusively applied, failed, even more signally than neuropathy, to reach their satisfactory interpretation. These several doctrines of disease—the humoral, chemical, and neuropathic—each present, in one form or another, the spirit of its own epoch, the one or the other ever rising above the wave of opposition which almost overwhelms it, comes forward vigorously claiming to possess the whole truth; and even at the present day they offer the same conflicting aspect which they did in years gone by, for each has its own prized modicum of truth, denied by others, while even that *modicum* is vitally essential to any system which would present the *whole* truth." (Vol. xi. p. 552.)

In this paper, and in the Prize Essay already referred to, Dr. Campbell enters into a well-informed review of the opinions of physiologists on the functions of the nervous system; though, like most other writers of the present day, he makes no reference to Whytt, who on various points of controverted priority respecting "reflex" and "sympathetic" actions, would have a very good right to come forward in the character of the umpire in the fable of the disputed oyster.

On the whole, this volume of Transactions, as well as its predecessors, affords a very favourable view of the intelligence and activity of our Transatlantic brethren, and we would remark that many of the contributors to them exhibit a scientific earnestness of purpose, and an enthusiastic addiction to their subject, which it is highly pleasing to contemplate, and which augurs most favourably for the future progress of medical science in America.

Of the twelfth volume of the 'Transactions of the American Medical Association' we can now only say that it contains a smaller variety of papers than the eleventh, a very large portion of the space being devoted to the observations on the malarial fever of the United States, by Professor Joseph Jones, which have since been republished in a separate form. We reserve any special remarks which we may have to make upon the contents of this volume for a future occasion.

REVIEW XIV.

Recherches sur les Kystes Muqueux du Sinus Maxillaire. Par J. A. C. GIRALDÈS, &c. &c. Mémoire couronné par l'Académie des Sciences. (1853. Prix Montyon.) Deuxième Édition.—*Paris*, 1860.

Researches into the Nature of the Mucous Cysts in the Antrum Highmori. By J. A. C. GIRALDÈS, M.D.

THAT this little pamphlet of only sixteen pages should have been thought worthy of the "Montyon Prize," the highest scientific distinction, we believe, accessible to medical emulation in Paris, is a sufficient proof of the opinion which the most competent judges have formed of M. Giraldès' work, and renders all eulogy of ours superfluous. Our task will therefore be little more than to give a short account of the results to which M. Giraldès' extensive researches have conducted him.

The pamphlet consists partly of an anatomical, and partly of a surgical portion, and is reprinted, with little variation, from a paper in the Mémoires de la Société de Chirurgie, vol. iii., an. 1853. In the anatomical part, M. Giraldès labours to rectify an error which exists, according to him, in all the received descriptions of the communication between the antrum and the nose. The object of this part of the paper is to show the impossibility of relieving collections of fluid in the antrum by catheterizing its opening in the middle meatus. M. Giraldès says,—

> "The description of the English anatomist (sc. Highmore) has been reproduced almost exactly by the authors who have succeeded him; far from perfecting it, or rendering it more exact, they have introduced errors into it, errors which have been copied by almost every one, and accepted without examination." (p. 1.)

Now, without denying that this sweeping charge may be generally deserved, we hope to succeed in showing that, at any rate, our two most recent English authorities, Messrs. Holden and Gray, ought to be exempted from it, since they have described the point in question in a manner which agrees in the most essential particulars with M. Giraldès, while they can hardly be exposed to the accusation which he brings against M. Sappey, of having plagiarized from him.

The anatomical point on which M. Giraldès differs from his predecessors is this, that he describes the antrum as opening into the lower part of the infundibulum, instead of possessing an independent opening into the middle meatus "below and behind" the infundibulum, as is described ordinarily.* He says that the large ragged opening seen in the macerated skull, is entirely closed by mucous membrane, while the real opening between the sinus and meatus is higher up, close to the floor of the orbit, and in the lower part of the infundibulum. When, besides this orifice of communication with the infundibulum, a second opening exists in the situation generally described, M. Giraldès believes that he can always find proof that this is the result of morbid thinning and absorption of the pituitary mucous membrane. This description is founded on the anatomical examination of no less than 150 subjects of all ages. We have ourselves examined various recent and other sections of the nose since M. Giraldès' pamphlet was put into our hands, and can testify to the accuracy of his description in what is, as it appears to us, its essential particular—viz., that the opening of the antrum is close to the floor of the orbit, and therefore quite at the upper part of the cavity; and further, that it is usually concealed in the ridge, or groove, which forms the termination of the infundibulum, and would be perfectly inaccessible during life. This fact, however, has not been passed over by the English anatomists whom we have just named. Mr. Holden says,

> "In the separate bone, this orifice is very irregular, and large enough to admit the end of a finger; but in the perfect skull, it is very much closed in

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* See Quain's Anatomy, vol. ii. p. 962. Fifth edition, 1848.

by the ethmoid, palate, and inferior spongy bones. . . . Observe, moreover, that the orifice is not near the bottom of the antrum, but very high up."*

He adds a note to the effect that there are sometimes two openings, and gives a diagram (pl. xx., p. 102), in which the orifice of the antrum is clearly shown in the position assigned to it by M. Giraldès,—viz., close to the floor of the orbit; besides which, another opening is shown lower down. In Mr. Gray's 'Anatomy,' 1859, p. 42, the position of the orifice is thus described.

> "In the articulated skull, this cavity communicates with the middle meatus of the nose, generally by two small apertures left between the above-mentioned bones (viz., the upper jaw, ethmoid, inferior turbinated, and palate). In the recent state, usually only one small opening exists, near the upper part of the cavity, sufficiently large to admit the end of a probe, the rest being filled in by the lining membrane of the nose."

On the same page is also a drawing of the superior maxillary bone, showing clearly the two openings described by M. Giraldès as existing in the dry bone, the larger one behind, which, he says, is closed in all cases by the mucous membrane, and the smaller one in front, in the situation of the lower end of the infundibulum. The difference between Mr. Gray's description and that of M. Giraldès is not more than usually exists between two independent accounts, by good observers, of any slightly complicated subject, and as M. Giraldès is known to be a diligent and accomplished English scholar, we are a little surprised that he did not consult our modern English books rather more carefully before reproducing from his original paper, read in 1853 to the Société de Chirurgie, the general accusation against all modern anatomists which we have quoted above. Had he done so, he would have found out from Mr. Holden that the antrum, although called by the name of Highmore (probably on account of the interesting case of disease of that cavity which he related), was known to Galen. M. Giraldès is therefore in error in saying that it was *discovered* by Casserius a few years before the appearance of Highmore's work; in fact, Highmore mentions it without any hint that he considers it a novelty, and as if it was an object quite familiar to anatomists.

We have dwelt longer on this part of the pamphlet than its intrinsic importance demanded, because we are anxious to impress upon our readers, both French and English, and more particularly upon M. Giraldès, if our respected colleague should ever do us the honour to glance at this page, that the anatomists of the London schools are not the careless copyists that he appears to represent them, but that much honest and good work lies hid even in some very remote and insignificant portions of their books.

It is true that both Mr. Holden and Mr. Gray have published their works subsequently to the first appearance of M. Giraldès' pamphlet, but we think that no one who reads their descriptions can fail to believe them independent of it. We have the best reason for asserting this in the case of Mr. Gray, having been favoured by that gentleman with an opportunity of inspecting the preparations from which his description was compiled, some of which still remain in the school to which he is attached. Both Mr. Holden and Mr. Gray, it will be observed, differ from M. Giraldès in believing that the second opening, when it exists, is a normal and not a diseased perforation—an opinion, by the way, for which our author does not, in this treatise at least, adduce any evidence.

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* Human Osteclogy, p. 77. Ed. 1855.

At any rate, all these accounts concur as to the essential particular of the uselessness and impracticability of the operation prescribed for the catheterization of the antrum—an operation, nevertheless, which M. Guérin* describes on the dead subject, and says that by the method he indicates he "almost always succeeds in passing a probe into the orifice." We should be curious to know whether M. Guérin ever ascertained by dissection the position of his probe. On the whole, we think M. Giraldès has succeeded in showing to demonstration the uselessness of attempting the relief of collections of fluid in the antrum by catheterization of its nasal orifice.

M. Giraldès' object, however, is chiefly to disprove the existence of any such collections of fluid as are generally intended under the term "dropsy of the antrum," and to show that the enlargement of the cheek in these cases depends on the development of mucous cysts in the thickness of the lining mucous membrane, and the general practical inference which he would draw we give in his own words:

> "It will be necessary to modify the treatment recommended for the pretended cases of dropsy, and instead of limiting ourselves to the evacuation of the sinus by means of a puncture or a loss of substance, it will be necessary to free it completely of the cystic products contained in its cavity. For this purpose it is indispensable to expose the sinus, and to open it largely, in order to remove the contained tumours completely." (p. 16.)

If we understand M. Giraldès correctly, he does not mean, in the present treatise, to lay down absolutely the doctrine that it is necessary, in all the cases usually described as dropsy of the antrum, to adopt the above severe treatment at the outset, but merely to indicate that in his opinion most of them will require it eventually. In fact, the evidence which he adduces hardly entitles him to assert absolutely that dropsy of the antrum never occurs. It has happened to us, and probably to most surgeons, to treat cases in which, apparently as the result of a carious tooth, swelling and pain in the cheek have appeared, and to relieve these symptoms by the extraction of the offending tooth and the passage of a probe into the antrum, this being followed by a copious muco-purulent discharge from that cavity. Now, in such a case as this, the absurdity of undertaking so extensive and severe an operation as M. Giraldès recommends is self-evident, and we have no doubt that our author, in some future and more extensive treatise, will give us a more complete classification and diagnosis of the various affections to which the antrum is liable. The present little tract completely fulfils its purpose, in calling attention to, and demonstrating by the

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* Elémens de Chirurgie Opératoire. Paris, 1855.

As far as we can understand this chapter, its main object is to prove that the mental phenomena of hypochondriasis are the result of disturbance in the chylopoietic viscera. What says our author on the question of treating aggravated cases of hypochondriasis as lunatics?

> "On being summoned to a case of this grave character, our first care and great aim should be, not to be carried away confused with the ugly external signs, and hurry the poor pitiable creature too hastily into the arms of forced restraint, but before we resort to any extreme measure of that kind, to pause and reflect a little over the case, first setting a careful watch over the patient, so that no injury is done to himself or to others. Till we have submitted the case to a course of careful constitutional treatment, coupled with energetic moral training over and over again resorted to—yea, seventy times seven should we struggle patiently, in all mercy and pity, to cure and to relieve, before we sit down to sign that awful warrant which is to separate a frail human being from home, friends, wife, children, and all the earth, save a whitewashed cell and a garden surrounded by its high brick wall."

Let us pass to gout, and cull a flower from the second chapter for the delectation of our readers. After making a confession of the many faults and feeble points that still cling to medical science, the author continues:

> "After these preliminary observations, we may now dive at once into *medias res*, and ask ourselves the very natural question—Why should this disease be allowed to remain so long a mystery and a medical enigma? Why should we not closely overhaul each and severally, as a whole, the various organs constituting the framework of the human system and their respective functions, and through these media fathom the root of the evil through all its ramifications? Why should we not commence an investigation of the complaint by regarding it as a 'blood disease?' Will not this definition immediately urge and fix us to the inquiry—what is the direct cause of this contamination? and thus simplify our ideas so that they can rest on a substantial basis and work out the problem?"

If Dr. Hughes is content with a definition or an idea upon which to work out the secrets of pathology, we confess to a weakness in favour of chemical analysis, the microscope, the balance, and those various aids to the positive determination of blood-poisons and their effects, which, *pace* Dr. Hughes, have contributed somewhat to the elucidation of the very question which to him is yet a complete mystery.

One more quotation and we take our leave of this book. In the third chapter the relation of uterine disease to disease of the blood is inquired into, and we find Dr. Hughes maintaining that "in the whole economy of the female system" there is no organ that is "so delicately susceptible of, or directly amenable to, any disturbance in the integrity of the functions of the several viscera which carry on bodily existence (*sic*) as the uterus." Still it is to the chylopoietic viscera that we should first look to rectify the derangements of the uterus, and they in their turn depend upon blood disease:

> "When a woman complains of having lost her sprightliness and energy of character, of performing every movement with an aching weariness, of feeling no proper desire for food, only a craving, capricious one—when a meal is taken, of its lying at the pit of the stomach as if a lump of lead were there—

that the stomach frequently rebels at its contents—that the bowels are sometimes costive, at others relaxed, with annoying tenesmus, and pass fœtid dark excretions—that the urine is scalding and loaded with deposits, and the kidneys distressed by the burden of poison they have to disencumber from the blood—that sympathetic pains are felt across the loins, simulating an attack of lumbago—that the heart and lungs share in the general turmoil of distress, one palpitating with the least exertion or mental excitement, the other harassing the pains and preventing rest by a dry hacking cough—that the head and brain do not stand aloof, but worry the patient with distracting headaches, while the mind is depressed with gloomy melancholy,—such a condition of the system as the foregoing, in a greater or less degree of intensity, indicates very forcibly a more or less foul state of the stomach, liver, and bowels. The sallow and variegated hue of the skin, which invariably attends many or most of these symptoms, clearly demonstrates the accompanying contamination of the blood."

ART. II.—*The Management of Infancy, Physiological and Moral, intended chiefly for the use of Parents.* By ANDREW COMBE, M.D., Fellow of the Royal College of Physicians of Edinburgh, and one of the Physicians in Ordinary in Scotland to the Queen. Ninth Edition. Revised and edited by Sir JAMES CLARK, Bart., M.D., F.R.S., Physician in Ordinary to the Queen and his Royal Highness the Prince Consort.—*Edinburgh*, 1860. pp. 302.

AMONG the multitudinous host of sanitary writers who have risen up of late years, one of the earliest still holds the most distinguished place. It would be difficult to estimate the amount of real practical good done to mankind by Dr. Andrew Combe, whose admirable work on the hygiene of childhood is now, thanks to the kind offices of Sir James Clark, again before us. All Dr. Andrew Combe's writings merit a careful study, but none has probably exercised so wide an influence as the one on 'The Management of Infancy.' Composed in a lucid and agreeable style, free from all dry technicalities which might deter any but a medical reader, it conveys important knowledge which concerns us all. To Dr. Combe we owe in a great measure the appreciation of sanitary laws which now so generally prevails, but their application to the development of the infant body and mind is still grievously misunderstood. Even professional men are far from being universally imbued with correct views on these subjects. To them, as well as to their patients, we would most earnestly commend the book before us; nor may it be without influence with many to know that their Queen is herself an illustration of the precepts which are here advocated. Her example is quoted in the body of the volume, and Sir James Clark, in the dedication, justly says—"Assuredly to no one could a work having for its object the preservation of infant life, and the improvement of the moral training and instruction of the young, be more appropriately dedicated than to your Majesty, whose management of your own family affords a bright example to parents, and a living testimony of being guided in the treatment of their offspring by the laws of health so clearly indicated by the Creator."

ART. III.—1. *De l'Alcoolisme. Thèse présentée au Concours pour l'Agrégation, et soutenue à la Faculté de Médecine de Paris.* Par V. A. RACLE, Médecin des Hôpitaux, &c.—*Paris*, 1860. pp. 122.
On Alcoholism. By V. A. RACLE, M.D.
2. *De l'Albuminurie. Thèse présentée au Concours pour l'Agrégation, et soutenue à la Faculté de Médecine de Paris.* Par PAUL LORAIN, Docteur en Médecine, &c. Avec une Planche.—*Paris*, 1860. pp. 130.
On Albuminuria. By PAUL LORAIN, M.D.

WE notice these two monographs together, because though treating of different subjects, they are both written for the same purpose—viz., that of qualifying for a professorship. They are both meritorious compilations, and do not claim to present any original matter. The circumstances under which they are written scarcely permit the introduction of the results of independent research.

The first discusses briefly the physiological, medical, and medico-legal aspects of alcoholism, a term which the author applies to all the effects produced by alcoholic beverages upon the human economy. Although he brings forward as a proof of the influence of certain kinds of food in diminishing the intoxicating influence of alcoholic beverages, the *fact* that "some Englishmen who wish to drink much at a meal, take very greasy soup, or even a small glass of oil, before beginning to drink," we cannot but admit that he has a good acquaintance with British medical literature on the scientific aspects of the subject. We can speak in more decided terms of praise of Dr. Lorain's monograph, which really contains a very complete, impartial, and well digested summary of the views entertained by the most eminent writers of all countries, on the subject of albuminuria and its pathological import. It is a book worth possessing, and one to which the practitioner may safely refer for information.

ART. IV.—*Medical Anatomy.* By FRANCIS SIBSON, M.D., F.R.S., Physician to St. Mary's Hospital. Fasciculus VI.—*London.*

THE present number of Dr. Sibson's 'Medical Anatomy' contains three plates, done in the same style as those contained in the previous fasciculi; they are illustrative of the effects of respiration on the external form and the relation of the internal organs. Each plate exhibits two views of the thorax after removal of the external integuments. The first is a front view, the second the lateral, and the third the dorsal aspect; in each case one drawing represents the state of the organs after expiration, the other after inspiration. Among other matters of interest to be found in the sixth fasciculus, we may specially note a series of observations made upon fifty men to determine the variations in the various phenomena of auscultation and percussion in the infra-clavicular regions and supra-spinous fossæ within the limits of perfect health. The main points are as follows:—The breath-sound during ordinary inspiration was equal on both sides in front in 26, louder on the right in 7, louder on the left in 17; during ordinary expiration it was equal in 28, louder on the right in 21, louder on the left in 1; the sound of the voice was equal in 3, louder on the right in 47. Exactly the same ratio prevailed in regard to vocal vibration; the heart-sounds were equal in 14, louder on the right in 29, louder on the left in 7 cases.

ART. V.—*Therapeutics and Materia Medica: a Systematic Treatise on the Action and Uses of Medicinal Agents, including their Description and History.* By ALFRED STILLÉ, M.D., late Professor of the Theory and Practice of Medicine in the Medical Department of Pennsylvania College, &c. Vol. I., pp. 813. Vol. II., pp. 975.—*Philadelphia*, 1860.

THIS is a very useful work of reference on the subjects indicated in the title-page. Essentially a compilation, the information it contains appears to be carefully and diligently brought together from many quarters, English writers very naturally enjoying a large share in the author's attention. The drugs are arranged according to their most prominent therapeutic properties, and in each case we find all the information which is supplied in regard to an individual article distributed under the heads, "Description," "History," and "Action and Uses." Two indices, the one to the materia medica, the other to diseases and their remedies, make the contents of the two volumes readily accessible.

ART. VI.—*On the Injurious Effects of Mercury in the Treatment of Disease.* By S. O. HABERSHON, M.D. London, Fellow of the Royal College of Physicians, Senior Assistant-Physician and Lecturer on Materia Medica and Therapeutics at Guy's Hospital, late Physician to the City Dispensary, &c.—*London*, 1860. pp. 86.

WE have long been expecting the appearance of a work like the one before us. In common with many members of the profession, we have felt that it would be most desirable to announce publicly that the calomelophagous tendencies of the British public were an abomination, and that rational medicine had ceased to impute to mercury the characters of a panacea. Though the preparations of this mineral have lost the prestige that once surrounded them, and though the medical mind is beginning to feel certain grave doubts as to the justice of many early impressions with regard to its powers, there can be no doubt that it is even now still exhibited in a manner prejudicial both to the welfare of the patient and to the interests of science. Dr. Habershon is a very able exponent of the extravagances of which we still bear the guilt, and he shows well the fallacies upon which the various theories have been built, that have made mercurials the main remedy, or more properly speaking, the main agent in the medical man's hands in the treatment of disease—

"For more than half a century the preparations of mercury have been em-

> ployed in the manner suggested by Dr. Hamilton, and at length it is used with most unsparing hand; our text-books recommend mercury in almost every disease, and the inexperienced unheedingly follow the dictum; in acute and in chronic disease, in so-called inflammatory and non-inflammatory ailment, in abnormal conditions of the nervous, respiratory, circulatory, or digestive systems, in renal or cutaneous disease, in blood diseases or in injuries, mercury finds its advocates, and has been given as if it were the panacea of human disease; and although at the present day many of the notions of the past have disappeared, as that excessive salivation is necessary to produce the desired effect, and that this may be measured by the quantity of saliva excreted, still, in the practice of many it is given in such a mode that salivation is produced, and the patient rendered anæmic and wretched; or where more cautiously administered, it is held in such regard, from the prejudices of practice and education, that many give it in instances where, we think, it is the means of aggravating the disease, increasing abnormal action, retarding recovery, and in not a few fatal cases of hastening a fatal termination." (p. 2.)

If Dr. Habershon's views are correct—and he gives us reasons for accepting them, which would have convinced us had not our experience already led us to the same conclusions—mercurials do not cure inflammation, and when given as antiphlogistics in inflammatory disorders, of whatever viscera, they impair nutrition and tend to protract convalescence. It would be easier to defend the administration of mercurials in acute inflammations than in many of the chronic affections, in which they are too frequently administered, to the detriment of the patient. The purgative properties of mercury, and its undoubted effects in unloading the liver and stimulating other secretions, often render it a valuable adjunct in the treatment of inflammations; Dr. Habershon, as we shall see, by no means universally condemns its employment, but it is especially in the following diseases that he holds it to be baneful—

> "1. In strumous diseases of the brain, lungs, abdomen, skin, bones, &c. 2. In degenerative changes of advanced life, as atheromatous deposit in the vessels, leading to apoplexy, ramollissement of the brain, &c., in fatty degenerations of the heart, aneurism. 3. In fevers and exanthems, as scarlet fever, typhus, measles, small-pox. 4. In conditions consequent on exhaustion, whether from over-fatigue, preternatural drain, mental anxiety, insufficient food, loss of blood. 5. In passive congestions of the lungs, uterus, &c., in states of weakness and loss of power. 6. In cancerous diseases. 7. In degeneration of the kidneys. 8. In diseases of the mucous membranes it is of very questionable utility, as bronchitis, enteritis, cæcal disease, dysentery, &c. 9. In diseases called inflammatory, as of the membranes and substance of the brain, of the lungs and pleura, of the pericardium and peritoneum, in croup, &c.; whilst in some cases the products of disease become absorbed and health restored, in very many instances the mal-nutrition consequent on the mercury, leads to increased effusion. 10. In rheumatism and its complications the advantage is not equivalent to the injurious effect." (p. 25.)

This is one side of the picture which the author holds up to our view, and we can only repeat that in the main we adopt his statements; on the other hand, he admits mercurials to be valuable remedial agents in certain forms of disease not enumerated in the above list, and he sums up the conditions where mercury is advantageous as follows—

> "1. In retained secretions, as from the bowels, liver, &c., it is often of great value. 2. As a speedy and efficient purgative. 3. As an excitant to the excretory organs in some forms of dropsy, of embarrassed heart, of bronchitis, &c. 4. In small or occasional doses where its more free or continued use would be detrimental in some of the classes to which we referred to its administration as being injurious. 5. In syphilitic diseases. 6. In some forms of gastrodynia and irritability of the stomach, the symptoms are alleviated by it. 7. In Asiatic cholera, although most severe cases have recovered after its administration, it is of doubtful efficacy. 8. Its local application in some cutaneous diseases and chronic ulceration is certainly salutary."

The subject is of too large a character fairly to be discussed in the brief space we can afford to it, but at the same time it is of too much importance not to render it imperative upon us to draw the attention of our readers to Dr. Habershon's valuable little book at the earliest opportunity afforded us, and in terms of strong recommendation.

Art. VII.—*Illustrations of Puerperal Fever.* By Edward Copeman, M.D., Physician to the Norfolk and Norwich Hospital, &c.—*London,* 1860. pp. 137.

The main object of Dr. Copeman's treatise is to advocate the treatment of puerperal fever by turpentine. In estimating the relative value of different methods of treatment, the first requisite is to be sure that we are dealing with the same disease throughout our observations. In this *brochure* before us, Dr. Copeman records the histories of thirty-six cases. The following quotation expresses the author's opinion of the nature of the disease:—"I believe there is no difference whatever, beyond what may be accounted for by the approximation or congregation of cases, between what has been termed the epidemic and any other form of puerperal fever." He adds his testimony to the experience of those who contend that the fever is propagated by the convection of the materies morbi from patient to patient by the medium of attendants. He thinks the essential cause is uterine; inflammation leading to irritating secretions, and the absorption of these producing the fever. The essential symptoms he describes are: "1. Rigor. 2. Abdominal or uterine pain, uneasiness, or tenderness. 3. Rapid pulse. 4. Disordered sensorium. 5. Tympanitic body. 6. Depraved lochial secretion. A very frequent precursory symptom is *sleeplessness;*" and Dr. Copeman insists that "whenever this occurs immediately after confinement, although everything else may appear to be going on well, it ought to put the practitioner on the alert."

These extracts are necessary for the purpose of satisfying our readers as to the nature of the affection which the author professes to treat successfully. "Turpentine," he says, "is our sheet-anchor," and he gives us the following very decided conclusions upon his experience of the use of turpentine in puerperal fever.

> "I do not think any such successful practice has ever hitherto appeared before the profession. Certainly, I am myself ignorant of the existence

of any half so favourable, though I have diligently searched for information upon the subject."

This strong expression coming from a physician of undoubted skill, naturally makes us anxious to know the amount of his success. We find recorded thirty-six cases. Of these twenty-three recovered and thirteen died. That is, the deaths were rather above one in three. It is right to state that the cases were all attended in consultation, and that therefore the presumption is reasonable that there were symptoms so severe as to raise alarm in the minds of the medical attendants, or of the patients and their friends. Further, it may be safely inferred—indeed, the perusal of the cases leaves no doubt upon this point—that some of them left little room for hope from any treatment when first seen.

Comparing his results with those of others, we are surprised Dr. Copeman has overlooked the statement of Dr. Ferguson, in his classical work. "My tables," says this distinguished physician, "give a loss of 68 in 204, or one in three;" nearly—not quite—as great as Dr. Copeman's loss. Dr. Ferguson did not use turpentine. Therefore Dr. Copeman has scarcely made out his case.

This caution we feel it our duty to utter, lest exaggerated expectations should be formed of the value of the remedy. We may recall that turpentine was introduced by Dr. Brenan of Dublin, in 1814. It was much praised by Dr. Douglas, and also by Dr. Kinneir of Edinburgh. It has since been repeatedly tried in Dublin, Paris, London, and elsewhere. That it is useful in some cases is certain. It is, however, very nauseous, and difficult to be taken. This objection may be greatly overcome by administering the remedy in capsules.

This contribution of Dr. Copeman deserves to be read as a valuable clinical illustration of a very terrible disease.

ART. VIII.—*The South of France; Notices, General and Medical, of Hyères, Cannes, Pau, and the Pyrenean Baths.* By EDWIN LEE, M.D.—*London*, 1860. Small 8vo. pp. 114.

DR. EDWIN LEE is well known as an indefatigable writer on the climates and watering-places of England, and of almost every country in Europe. The present little work contains much general as well as medical information regarding the places mentioned in the title, which will be found highly useful to the invalid or the traveller about to visit them. It is also well worthy of perusal by members of our profession, from whom patients generally expect to obtain some knowledge respecting not only the climate, but the features of the surrounding country, the nature of the accommodation, the provisions, &c., of the places recommended to them for the benefit of their health.

ART. IX.—*The Pathology and Treatment of Venereal Diseases: comprising the most recent doctrines on the subject.* By JOHN HARRISON, F.R.C.S.—*London*, 1860. pp. 176.

THIS little work will be found useful by the student, or the practitioner at the commencement of his career, as giving in intelligible language and in the briefest possible space, a summary of some of the more modern theories on the various questions connected with syphilis, and prescribing a course of treatment in each case which, if not very original, is something better—viz., safe and rational. Mr. Harrison has evidently had a very extensive experience in this branch of surgery, and has used both his own and other men's researches to good profit in shaping for himself a trustworthy guide to practice. Under these circumstances we think he is fairly entitled to speak on the subject of his own speciality; and we further think that he has spoken to good effect, sometimes perhaps in rather too brief and oracular style, but usually with great lucidity and decision. A comparison between such a book as this, in which the new doctrines on syphilis are set forth, with the treatise of John Hunter, will show how much the study of syphilis has gained in precision since that great surgeon wrote; but it will show not less distinctly the many points which still remain for elucidation. These points are not passed over by our author, and on most of them he gives a clear opinion—not always detailing the course of reasoning which has led him to form it, but always holding out some light to his reader.

ART. X.—*Transactions of the Pathological Society of London.* Vol. X., including the Report of the Proceedings for the Session 1858–9.—*London,* 1859. pp. 365.

WE are happy in being able again to point to the annual volume issued by the Pathological Society as a valuable contribution to medical literature, no less than as a memorial of the work done by its members. Not long since (vol. xxii. p. 416) we gave a general *résumé* of the labours of the Society during the first ten years of its existence, to which we must refer for our general estimate of the manner in which it fulfils its functions. It is out of our power on the present occasion to do more than draw the attention of our readers to this important storehouse of facts. Among them we may signalize the collection of cases of obstructed cerebral arteries, by Dr. Bristowe; the various forms of disease affecting the ovaries, by Mr. Spencer Wells; the illustrations of diphtheria, by Drs. Peacock, Semple, Harley, and others; the inquiry by Dr. Bristowe and Mr. Ord into the existence of amylaceous compounds in the human body, as deserving special attention. Nor would it be right to conclude this brief notice without thanking the secretaries, both of whose names appear frequently among the exhibitors, for the very excellent manner in which they have performed their duties as editors of the volume.

ART. XI.—*A Manual of the Sub-Kingdom Protozoa; with a General Introduction on the Principles of Zoology.* By JOSEPH REAY GREENE, B.A., Professor of Natural History in Queen's College, Cork.—*London,* 1859. Small 8vo. pp. 88.

THIS work, the first part of a manual on the entire animal kingdom, about to be issued by Messrs. Galbraith and Haughton, is a concise compilation of our existing knowledge of the subject on which it treats, and has been executed with a considerable amount of care; but it is doubtful if it will be found more useful than many of the popular treatises on natural history with which our book-market is already inundated. The work does not enter into sufficient detail to render it of much service to the professed zoologist; and intended, as it must be, for the general student, it appears to be far too encumbered with the classifications and divisions of different systematic writers, as to the real meaning of which the reader is almost entirely left in darkness. The book is illustrated by some capital woodcuts—most, if not all, of which are copies, but some of which seem to be finished in a manner superior to the originals.

ART. XII. — *Om Uræmi.* Akademisk Afhandling. Af SAMUEL GUSTAF TROILIUS.—*Stockholm,* 1858. 8vo. pp. 56.
On Uræmia. An Academic Thesis. By SAMUEL GUSTAVUS TROILIUS.

THE author defines uræmia as an intoxication depending on the presence in the blood of the products of the decomposition of urea, unconnected with any constant pathological changes, except that the blood usually contains carbonate of ammonia, along with still undecomposed urea. The author compares the effects of urea in the blood with those of pus, an abnormal, and of bile, a normal product. The objection, that it is impossible that so many and various effects as are attributed to the existence of urea in the blood should be due to a single agent, the author meets by quoting from Dr. Huss the various effects attributed by all to the operation of the miasm of typhus, an hypothetically assumed body, which no one has ever seen; and which cannot be made perceptible to our senses by the most delicate chemical reagents, but manifests itself only by its effects on the human organism. Syphilis, again, affords an example of the most varied effects produced by a virus whose vehicle is a pus which no one has yet succeeded in distinguishing, either by its microscopic characters or chemical reagents from the surgeon's "pus bonum et laudabile." Some few authors, denying the action of uræmia, have endeavoured to explain the symptoms in another mode. Osborne seeks their cause in arachnitis, but this view is refuted by morbid anatomy. Owen Rees refers them to hydræmia, but Frerichs shows that uræmic convulsions and coma are often observed in the several stages of scarlatina and typhus, without our being able to assume the existence of any dilution of the blood. "In the typhoid of cholera," adds the author, "which I shall hereafter endeavour to prove referrible to uræmic intoxication, hydræmia can scarcely be supposed to have existed." After such a line of argument, Herr Troilius proceeds to the consideration of the several symptoms of uræmia.

The symptoms of uræmia proceed chiefly from the nervous system, exhibiting themselves as lesions of the functions of the brain and spinal cord. At the same time the uræmic intoxication manifests itself in changes in the secreting and motor functions of the stomach, and perhaps also of the intestinal canal, and in abnormal secretions from the lungs and skin. The author adopts Frerichs' division into the acute and chronic forms.

Uræmic amblyopia is characterized by its variability. Sometimes complete blindness occurs suddenly during a comatose or convulsive attack, and again disappears after its cessation. Uræmic amaurosis causes no specially visible changes in the eye. As to the state of the pupil, opinions are divided. Some have found it dilated, others normal (Frerichs), others, again, contracted. Probably the first case is the most usual. The pupil is sluggish to the influence of light.

The author passes in review affections of the organ of hearing, vomitings, profuse diarrhœas, &c., and considers "two diseases, the uræmic nature of which has been, on account of the unusual circumstances under which the intoxication occurs, mistaken and strenuously denied, but which I believe, although I cannot fully prove it, I can show to be extremely probable—I allude to cholera-typhoid and eclampsia puerperalis." Of the former of these affections, the symptom which gives the key to its nature is the condition of the urinary secretion. This secretion either continues to be suppressed, or on the third or fourth day commences to pass off in very inconsiderable quantity, and is found to contain fibrinous casts of the tubuli uriniferi and albumen, while urea is present in much less than the normal proportion.* If the quantity of the urine increases, the amount of urea likewise rises to two or three times the normal proportion, while the albumen and tubular casts disappear. At the same time the symptoms diminish, and the disease ends favourably. If, on the contrary, the suppression continues, the disease becomes gradually aggravated, deep coma and death supervene.

The author devotes a few pages to the further consideration of "cholera-typhus," then passes to that of eclampsia parturientium; after which he discusses the remote causes of uræmia, its diagnosis, prognosis, and treatment. The foregoing abstract of a portion of Hr. Troilius's work will suffice to show the comprehensive nature of its contents; the writer is evidently well acquainted with the literature of his subject, and in a short space has given a clear and interesting account of the present state of our knowledge with respect to uræmia.

ART. XIII.—*The Manchester Flora: a Descriptive List of the Plants Growing Wild within Eighteen Miles of Manchester, with Notices of the Plants commonly Cultivated in Gardens, preceded by an Introduction to Botany.* By LEO HARTLY GRINDON, Lecturer on Botany at the Royal School of Medicine, Manchester. With numerous Woodcut Illustrations.—*London* and *Manchester*, 1859. pp. 575.

THIS book is arranged in such a way as to make the information it affords readily available—no small recommendation in a Flora intended for the use of amateur botanists. By its aid the Mancastrian man, youth, or maiden may trace the history, name, and habitat of all the plants growing within a certain radius of their town, and we doubt not that it will in that locality tend to promote a love of the study of God's manifestations in one of the most charming spheres of creation. The book begins with a general introduction to the science of botany, followed by an explanation of the particular design of the work, and instructions how to use it. We next meet with an artificial key to the families of plants, by which the student may be enabled to determine the position of a given specimen; after this comes a key to the trees, arborescent and climbing shrubs of not less than nine feet high. Then at the eighty-first page commences the Flora itself; Exogens taking precedence with the most beautiful representative of the water lily family, the Victoria Regia. The whole range of botanical science passes successively in review, ending with the family of Algæ. The illustrations are numerous and perfectly intelligible, and a glossary and two ample indices still further enhance the practical character of a book which we trust the booksellers of Manchester may be very frequently called upon to supply to their customers.

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* Buhl: Zeitschrift für rationelle Medicin, Band vi.

ART. XIV.—*On the Radical Cure of Varicocele by Subcutaneous Incision.* Read before the Medical Society of London. By HENRY LEE, Surgeon to King's College Hospital, Senior Surgeon to the Lock Hospital and Asylum, &c.—*London*, 1860. pp. 24.

WE can recommend this little work to students and practitioners who may not be familiar with Mr. Lee's method of operating on varicose veins, as containing a clear and readable description of an operation which they may be frequently induced to practise. The present paper refers more particularly to varicocele; but the method of operating on veins in any other region is incidentally described. Varicose veins, both in the scrotum and other situations, are often left alone, or treated merely by palliative measures, from an idea of the danger of meddling with them—an idea founded on the cases mentioned by Sir B. Brodie in his 'Lectures on Pathology and Surgery.' In those cases, however, the treatment adopted necessarily involved the risk of suppuration inside the vein. When the vein was tied on Sir Everard Home's plan, the ligature was left to cut its way out; when divided subcutaneously, as recommended by Sir B. Brodie, its ends were left gaping in the cellular tissue, and exposed of course to the risks induced by suppuration of the wound. In either method if the wound, instead of uniting by the first intention, happened to generate pus, it was a mere chance whether that pus was introduced into the cavity of the vein or not; and no question now exists of the dangerous effects of the formation of pus in contact with the lining membrane of these vessels. Now, Mr. Lee's plan combines the advantages of both methods, and avoids their dangers completely. The veins are tied in two places, and their contents thus made to coagulate; but when this is done, the ligatures are removed, so that the vein is not divided by them. It is cut across between them; but here the previously-formed coagulum and the obliteration of the vein beyond it prevent all risk of diffuse inflammation of its lining membrane.

Art. XV.—*Researches on Primary Pathology, and the Origin and Laws of Epidemics.* By M. L. Knapp, M.D., President of the College of Physicians and Surgeons of the University of Iowa. Two vols. 8vo.—*Philadelphia*, 1858. Vol. I., pp. 312; Vol. II., pp. 336.

This work is prefaced by a high-sounding Dedication to the American Medical Association, the London College of Physicians, and the Institute of France, in the hope that, for humanity's sake, commissions may be appointed by each body respectively to report on the truth or fallacy of the new doctrines of the author; and the first chapter is headed by the somewhat arrogant title, "Discovery of the Cause, Nature, Cure, and Prevention of Epidemic Cholera." The reader, then, will be a little surprised to find that the author has devoted his two goodly volumes to prove, that not only cholera but every disease to which flesh is heir, arises from scurvy or the scorbutic diathesis. The key to the whole work will be found in the startling announcement which heads the first chapter in the second volume—"The Scorbutic Diathesis is Primary Pathology"!! The scorbutic diathesis is thought to be induced by whatever tends to impair the nutrition of the individual, and so lead to inanition. "There is but one primary pathology, and this essentially *inanition*." (Vol. ii. p. 22.) And again:

> "Our philosophy, then, clears away the obfuscations in pathology, digs to the bottom, and unfolds *primary pathology*, the root of all diseases; for all the known causes of pestilence, as we have shown, produce their effects by impairing the nutritive function; and we do not admit any hypothetical causes, such as a supposed 'malaria,' or 'epidemic influence,' or 'occult qualities in the air,' &c.; these terms are only cloaks for our ignorance, that hinder the progress of science." (Vol. ii. p. 37.)

The President of the College of Physicians of Iowa demolishes at one fell swoop the whole doctrine of malaria and of contagion, he sets at nought the influence of all atmospheric agencies in the production of disease, and he decries all modern investigations into pathology, except his own, as tending to confuse rather than to enlighten. Everything, in fact, is put down to scurvy. This is an easy doctrine; but surely the unceremonious manner in which the labours of many of the greatest ornaments of our profession, both in this and in past ages, are thrown aside, is somewhat scurvy treatment on the part of the author.

Art. XVI.—*Manual of Botany.* By John Hutton Balfour, A.M., M.D., F.R.SS. L. and E., &c. New Edition.—*Edinburgh*, 1860. pp. 703.

When we view the works of certain of our distinguished artists we are struck with the gorgeous colours of the great pictures on which we gaze, with the beauty of their tints, the harmonies which are produced by the judicious juxtapositions of colours, and by the glow of glory which pervades the whole; but when we turn to the landscapes which have been thus depicted, we fail to discover the same play of colours which were presented to us by the painters, and we thus learn that the artist, while he had gone to nature for the scene which he has represented, has yet turned it into a glorious fairyland by his own enchantments. If, however, we behold the works of certain other painters, we view a true portrait of the objects portrayed; every stem has its true markings, every leaf its beautiful contour, and every flower its just shape—in fact, there is not a form, or a tint, or an atmospheric effect depicted on the canvas which has not its true parallel in nature. Now, to the latter class of pictures we may liken Dr. Balfour's admirable book. It is needless to say that the wild flights of fancy are not appropriate to the stern realities of a science which consists in the most accurate knowledge of natural objects, and Dr. Balfour, in the manual before us, gives in a clear and full manner a representation of the whole facts of the science as they stand at this very hour.

The merits of the work need not be dwelt upon, as it has already passed through several editions as a volume of the 'Encyclopædia Metropolitana,' but as it has now been revised by the author and brought up to the present state of science, its value is much enhanced; it embraces the structure, physiology, and classification of plants, and a very interesting sketch of palæontological or fossil botany; to which is added, in the form of an appendix, a treatise on the use of the microscope in botanical research; directions for collecting and examining plants; hints as to the preparations to be made for alpine travelling, particularly in Switzerland (a subject now of very general interest); directions to collectors visiting foreign countries, and a glossary of botanical terms. This volume is therefore a complete students' manual, and we strongly recommend it as a work of sterling worth.

ART. XVII.—*Summary of New Publications.*

AMONG the purely medical works to which we would here direct attention we may first mention Dr. Winslow's volume 'On Obscure Diseases of the Brain and Disorders of the Mind,' which will be found to throw much light on these subjects; we hope to review it in our next, with a work by Dr. Laycock, entitled 'Mind and Brain,' which is of a more purely physiological character, and one which tends to place psychology on a firmer basis than it has hitherto rested upon. It impresses us as being the best of Professor Laycock's works. Dr. Camplin has republished, with considerable additions, the paper which appeared in the 'Medico-Chirurgical Transactions'* some years back, 'On the Juvantia and Lædentia in Diabetes.' Dr. Fuller's excellent work on Rheumatism appears in a third edition, considerably enlarged;

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* Vol. xxxviii.

the additions being chiefly in the second chapter, which treats of rheumatic gout, and in the thirteenth, which discusses the hypodermic and other methods of treating sciatica. Dr. Collinson, in a well-written pamphlet 'On Small-pox and Vaccination,' urges the necessity of renewing the lymph to prevent its deterioration, together with the necessity of more stringent legislation. The Scotch Lunacy Commissioners have issued a 'Second Annual Report,' from which we regret to learn that as in England, so in Scotland, the number of the insane is decidedly on the increase. A learned work, by Dr. Bucknill, 'On Shakespeare's Medical Knowledge,' will be acceptable to all who have already become acquainted with that author's admirable exposition of the profound knowledge of mental aberration displayed in the tragedies of our great poet. Dr. Beale continues the publication of his interesting 'Archives;' from Mr. Ballard we receive a suggestive little book, offering an explanation of some of the maladies incidental to infants. Dr. Cockle is republishing his learned lectures 'On the Historic Literature of the Pathology of the Heart and Great Vessels.' From Dr. Salter we receive an important and very interesting work 'On Spasmodic Asthma,' in which the views which he has recently brought before the Profession in this and other Journals are republished with considerable additions.

The chief work in Surgery that has come to hand is a very practical one, treating of a great number of very interesting subjects, entitled 'Conférences de Clinique Chirurgicale faites à l'Hôtel Dieu;' they were delivered by M. Robert, and have been put into readable shape by Mr. Doumie. Mr. Maunder favours us with Part I. of a well illustrated 'Manual of Operative Surgery,' which the student will find very useful.

The great fact in British Midwifery during the present year is the appearance of a volume emanating from the Obstetrical Society of London. The 'Transactions' are of a very practical character, and will doubtless prove acceptable to the Profession. We shall epitomize them in our next number; when we shall notice in detail Dr. Graily Hewitt's paper 'On Vesicular Mole,' of which a separate copy is before us. Dr. Churchill's valuable 'Manual of Midwifery' is before us, in a fourth edition, which is brought down to the most recent period; the chief additions are in the chapter on Craniotomy, and an article on Obstetric Morality. A portion of Kiwisch's lectures treating on 'Ovarian Disease,' appears in an English translation by Mr. Clay. From the United States we receive, at the last moment of going to press, the sixth edition of Dr. Bedford's 'Clinical Lectures[*] on the Diseases of Women and Children,' professing to be carefully revised and enlarged.

Materia Medica supplies us with a new and much improved edition of A. Becquerel's[†] 'Treatise on Galvanism;' the additions extend to nearly 200 pages, they are chiefly in the chapters on Paralysis. We are glad to see that Dr. Becquerel represents the views of Marshall

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[*] See British and Foreign Medico-Chir. Review, vol. xvii. p. 34.

[†] See a review of the first edition in this Review for Jan. 1859, p. 91.

Hall correctly in the present volume. Dr. Kronser urges the employment of the Carlsbad waters in diabetes; from Dr. Bentley we receive a paper 'On the Distinctive Characters of the Matricaria Parthenium and Anthemis Nobilis.'

In Physiology and Anatomy the following are the prominent works of the past quarter:—A fresh translation of Kölliker's 'Manual of Microscopic Anatomy, already known to our readers by the Sydenham Society's edition, somewhat abridged, with recasting of some of the parts, and with additional illustrations; Dr. Humphry's 'Observations on the Limbs of Vertebrate Animals,' in regard to their construction and homology; the second volume of Mr. Lewes' 'Physiology of Common Life,' which completes a most suggestive and interesting work; and a retrospect of the recent advances in the 'Physiology and Pathology of the Nervous System,' by Dr. Waters.

Numerous works of a miscellaneous character are yet before us, some only of which, however, the space at our command will allow us to enumerate. They are, Professor Owen's new work 'On Palæontology;' Mr. Elmes' volume of 'Medical Jurisprudence,' from the United States; Mr. Nesbit's pamphlet, containing analyses of all the varieties of guano in use in England, with practical advice to farmers; Mr. Searle's 'Science of Life, Health, and Disease,' a work which the author tells us in the preface is "a right valuable one." Dr. Letheby, in his 'Annual Report,' shows us that the health of the City of London has considerably improved during the past ten years, but that much yet remains to be done in a sanitary point of view; in another pamphlet he gives reasons for disapproving of the perchloride of iron as a deodorizing agent. Dr. Ward, in an oration delivered before the Hunterian Society, discusses very wisely the 'Position and Prospects of Rational Medicine;' a lady, named M. A. Baines, advocates the more frequent use of farinaceous food as a substitute for mother's milk for infants. Among the other works and serials that are on our table, we would only signalize as one of the painful signs of the times, 'The Spiritual Magazine.' Can we wonder at the increase of insanity which has manifestly occurred in Great Britain of late, when the delusions and follies related in the magazine are regarded by people of education as veritable manifestations of the intercourse between the material and spiritual worlds? Willingly do we leave 'The Spiritual Magazine' to the witty corrections and stinging castigations of 'Punch;' he deals with it as such things ought alone to be dealt with. We should, however, be neglectful of our duty, if we did not once for all express our grief that such aberrations should exist, and that they should be fostered and encouraged in any way.

PART THIRD.

Original Communications.

Art. I.

On the Progressive Paralysis of the Insane. By William Wood, M.D., Member of the Royal College of Physicians, &c.

It is a merciful provision that the victims of the most fatal maladies which affect our race are not only unwilling, but apparently unable, as a rule, to realize the hopelessness of their condition. The sanguine hopes which may be almost enumerated as among the symptoms of the worst cases of phthisis lighten the load of the sufferer, even to the last hour of existence, and not unfrequently deceive the anxious friends, who are but too willing to believe that the case is not yet past recovery. It is remarkable how cheerful in their unbelief are the victims of cancer in its early stages, and how incapable they appear to be to accept the decision which is in fact a sentence of death in one of its most suffering forms; and even when the truth can no longer be disguised, and the disease is established in all its dread reality, there is more of submission than despair in their manner of bearing their terrible affliction. And when we come to consider the phenomena of insanity, although doubtless many patients chafe under the control which it becomes necessary to exercise over them, we find, notwithstanding exceptions, that this fearful malady is shorn of much of its terrors to the victims themselves, by their inability to recognise its true nature and realize its possible or probable consequences; and in no form of disease with which we are acquainted, whether of a bodily or mental nature, is this so remarkable as in that which has hitherto been known as the general paralysis of the insane—a designation, by the way, which, as it is admitted to be inappropriate, I propose to vary by adopting one more in accordance with the characteristics of the malady, and therefore less likely to convey an erroneous impression of its nature. It is not only that persons so afflicted are commonly hopeful and patient and submissive, but they are, in the majority of cases, in a state of exalted happiness, founded upon their insane convictions that they are healthy and strong, wealthy and powerful; and though by a steady decadence of the intellectual and physical powers they are reduced to the most deplorable condition of helplessness and infirmity, they are yet sustained in a prolonged ecstasy of joyous satisfaction by those very delusions which constitute one of the most fatal symptoms of their malady. It can scarcely be a matter of surprise that this disease is so little known to the profession generally, for independently of the fact that but few cases comparatively are recognised before they are presented for admission into an asylum or hospital for the insane, the very name, general paralysis, has misled many who, naturally expecting well-marked paralysis of sensation and motion, have overlooked the uncertain gait and tremulous articulation which to the experienced eye are as unmistakeable as they are fatal symptoms of this disease.

The first question which we have to consider in treating of what has hitherto been called general paralysis of the insane is, in what sense do we use the phrase? Do we really mean by general paralysis what the words seem to imply — viz., absolute and complete loss of power and sensation? No, this cannot be, for with the occurrence of such a state life is extinguished; a disease characterized by such symptoms cannot therefore exist but in a certain limited degree; it can only be, then, in the sense of a limited degree of paralysis affecting all parts of the body, and gradually increasing the general helplessness, that we can apply the term general. But we do not meet with such a condition; it is not all parts of the body that are at once attacked—although, as the malady progresses, organs and limbs become implicated which were not affected in the first instance, until every function is more or less involved. Since the publication of Calmeil's work on the 'Paralysie Générale des Aliénés,' in 1826, our ideas on the subject have been almost entirely limited to one particular condition, characterized by a peculiar difficulty of articulation, unstable gait, extravagant ideas, &c. —symptoms undoubtedly pathognomonic of one form of the disease, but some of which may nevertheless be wanting in the early stages, and some of which may never manifest themselves at all, even though the reality of the case be attested by its fatal issue. Other writers on the subject have not sufficiently dwelt upon the fact that, short of these well-marked cases, there are all degrees of paralysis affecting insane persons, independent of those local and partial paralytic affections which are commonly seen in persons not insane. In addition to the liability to all forms of paralysis which the insane have in common with all other persons, they have a peculiar proclivity to diseases of the parts within the cranium, by reason, no doubt, of the disturbance to the circulation in those parts attending every derangement of the mental faculties; and though our very limited knowledge has not yet permitted us to recognise all the structural changes which doubtless occur in the brain and its appendages, or to connect with certainty those which we do recognise with particular conditions during life, we may yet hope that improved means of observation will ultimately clear up much of the mystery which at present involves the whole subject.

It is of some importance that we should not be misled by names, and we are at once struck with the inconvenience of that by which this state has been hitherto known. The expression "general paralysis" is inappropriate as applied to the various forms and degrees of paralysis affecting the insane, which have generally been included in this definition, because it implies a condition which does not really exist, and diverts attention from symptoms which, though but indistinctly marked, are of the greatest importance where recognised in an early stage, when treatment may be adopted with some more hope of arresting the progress of the disease than it can be at any future period. It is also inappropriate, inasmuch as it does not correctly describe the disease as it frequently appears—that is to say, there occur cases in which, for example, the peculiar failing of speech is not present, at any rate, until a more advanced period; others in which this is an early symptom, the loss of power over the limbs being not yet apparent; again, the extravagant ideas in regard to wealth and possessions are often delayed, sometimes never occur at all, and not unfrequently, instead of them, there are the most terrible delusions of poverty and impending horrors of all kinds, with such extreme agitation that it is difficult at times to distinguish between the uncertainty of movements depending on this cause, and that which is the effect of impaired muscular power. In no sense, then, can the term "general" be employed with strict propriety, excepting as indicating the course which it was probable the disease would run, and the symptoms which it was anticipated would be developed. M. Calmeil, the great authority on this subject, in his recent and elaborate work,* has proposed to designate this malady by the phrase "Paralysie Générale Incomplète," or "Péri-encéphalite Chronique Diffuse." The latter is perhaps the less objectionable of the two, though it assumes a condition of parts which can scarcely be said to be admitted as an invariable cause of the symptoms, notwithstanding proof that every case is attended with some evidence of inflammatory action within the cranium. The addition of the word "incomplète" to the old name is less satisfactory, and seems to involve a contradiction of terms. It has already been observed that the paralysis, though tending to that condition which might properly be called general, is not really so until its termination; and therefore, when the term general becomes appropriate, the word "incomplete" ceases to be applicable, for the general implication of the whole body goes on at the same progressive rate as the completeness; in other words, as the disease becomes more universal, involving more and more the different limbs and organs at the same time, it becomes more marked, so that by the time it has become general in the strict sense of the word, it has also become complete, and the vital functions cease. The inconvenience of changing a name which has been for years established is so great, that I should hesitate to propose any alteration, if M. Calmeil had not himself appreciated the objections to the continued employment of this designation, and suggested an amended description. Taking it, then, as an admitted fact, that the term general paralysis is so inappropriate as to render it necessary, in the judgment of M. Calmeil, to alter it, and to adopt the phrase "paralysie générale incomplète" in the place of "paralysie générale des aliénés," it is very desirable before admitting the new name, that the objections to it should be well considered, and that we may not in a few years' time, as the result of increased experience, be invited to another christening, or be obliged to submit to the continued use of an expression which would convey an erroneous impression of the view we might then take of the nature of the disease. We have an instance of this in the case of the words, lunatic and lunacy, founded originally upon a belief that all persons suffering from mental disturbance were the subjects of peculiar and direct lunar influence. Although few now hold this belief, the names which were founded upon it are retained, notwithstanding that they are admitted on all hands to be inappropriate, and are felt by those to whom they are applied to be most offensive and opprobrious. The difficulty of suggesting, and the inconvenience of adopting, a new name is so great, that notwithstanding all the serious disadvantages attending the practice, we persist in applying to those whose feelings in all other matters we are most properly solicitous to spare, epithets which are felt to be as irritating and degrading as they are admitted to be unfounded in reason. If, then, we must change the designation of a malady which has been known to us so many years as the general paralysis of the insane, at least let us be careful to adopt a name which is consistent with our present knowledge of the subject, and which, as far as it goes, conveys a correct impression of the nature of the malady.

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* Traité des Maladies Inflammatoires du Cerveau. Paris, 1859.

It may be remarked then, in the first place, that this disease is essentially progressive in its nature, as distinguished from the more ordinary forms of paralysis, which are usually established somewhat suddenly. It commences so insidiously, that until it has made fatal progress it can hardly be said positively to exist; and although the attendant symptoms furnish a strong suspicion that it is, in fact, in a progressive state of development, many of these symptoms are observed in cases where the patients recover without manifesting any positive paralysis. Then, again, this form of paralysis is progressive not only in its development in the particular part or parts of the body in which it first presents itself, as evidenced by the gradually increasing difficulty of articulation, &c., but also in its extension by degrees not only in the parts already attacked, but in turn to all parts of the body, until every limb and every function becomes involved, and ultimately so deprived of nervous influence, that life can no longer be maintained, the vital organs ceasing to act, not as a consequence of structural disease in themselves, for it is not uncommon to find in post-mortem examinations of these cases the contents of the chest and abdomen healthy, but as the result of a certain altered condition of the brain and its membranes. Seeing, then, that this disease is in its nature essentially progressive, I propose to adopt this word in preference to that which is now admitted to be inappropriate, and to speak of the "progressive paralysis of the insane," instead of the "general paralysis of the insane." I am aware that this description is open to the objection that the disease which it is intended to designate does not invariably advance to a fatal termination without remissions, and that consequently it is not at all times progressive. But notwithstanding the occasional alleviation of the symptoms, the actual arrest of the disease, when once fully established, is very rare; and with few exceptions, the general condition of the patient continues to deteriorate, although there may be from time to time a temporary gleam of reason, and with it some increase of voluntary power. The return of all the symptoms in the same, if not in greater intensity than before, proves that the fire, though for a time subdued, was not extinguished; that, in fact, the disease still existed, though there had been every now and then a lull in the symptoms. Then, again, as already observed, the disease, unlike most others, is not limited to any particular limbs or organs, but by progressive steps it comes at last to involve every part of the body; and this being a chief characteristic of the malady, must remain a fact, whatever different views, in consequence of increased experience and improved means of observation, we may be led to entertain of the pathological changes which attend, and which are presumed to cause, these peculiar symptoms.

Various alterations have been from time to time proposed in the name of this disease. M. Parchappe calls it "folie paralytique;" and this designation has been adopted by M. Jules Falret and others. M. Regnin proposed to substitute "paralysie générale progressive" for the "paralysie générale des aliénés," and this, again, has found favour with some who have written on the subject. To say nothing of the inconvenience which would attend the employment of this phrase in consequence of its length, it does not appear that we gain anything in correctness of designation by retaining the word "générale," and therefore I have adopted the expression "progressive paralysis," as convenient and more in accordance with the phenomena which are presented; it also has this advantage, that it will be equally applicable whatever the mental condition, and this is of the more importance, inasmuch as considerable difference of opinion exists amongst French writers on this subject as to the circumstances in connexion with which these symptoms are occasionally developed, some maintaining that they frequently occur without any well-marked mental disturbance, others believing that this never occurs, and that the disease is, in fact, peculiar to the insane. An interesting case, apparently justifying this difference, occurred in the Royal Edinburgh Asylum, which is alluded to in the Report of that institution for 1848:

> "It was that of a gentleman, who on his admission presented in a well-marked degree all the features of that most hopeless and distressing disease—the general paralysis of the insane. The imperfect articulation of words, the staggering gait, and the peculiar delirium of ambition and wealth, so characteristic of this disease, were all present. These symptoms developed themselves after some previous indications of approaching insanity, but without being preceded by any symptoms of an affection of the brain. Contrary to all expectation, and to general experience in such cases, in a few months he was restored to perfect sanity of mind; and although the incomplete general paralysis remained, his friends and family could not detect the least trace of mental aberration or impairment. Subsequent to his discharge he continued in this state for some months; but after being exposed to great mental anxiety, he was soon after seized with convulsions, which continued to recur

with increasing violence until he died, his mind remaining unaffected to the last."

It is not contended that there are not cases occurring in persons who have not manifested any derangement of the intellectual faculties, which are known as general paralysis, in contradistinction to the different forms of partial and local paralysis; but these, besides being exceptional, are quite distinct from the class of cases to which we propose to give the name progressive paralysis, and need not therefore be further referred to. Our continental neighbours, who have investigated and very carefully observed the various symptoms occurring in cases of mental disturbance, have rather complicated the subject by scientific refinements and subdivisions of the malady, in which it is not desirable that we should enter, for independently of other reasons, want of space would prohibit the full consideration of the different views promulgated by men of the first eminence in their profession. My object is to simplify the matter as much as possible, and in taking a practical view of it, to avoid the discussion of disputed points, which are more likely to embarrass than assist the judgment in forming an opinion of a class of cases, the diagnosis of which is necessarily difficult to the majority of the profession, who have had no special experience in them. I shall content myself, therefore, with quoting from M. Jules Falret the following passage, which shows what are the principal different opinions held by French writers of eminence on this subject. He says:

> "Il existe quatre opinions principales relativement à la paralysie générale: l'une, la plus ancienne de toutes, admise par MM. Delaye, Calmeil, Georget, par Esquirol, et la plûpart de ses élèves, consiste à considérer cètte maladie comme une simple complication ou même comme une terminaison de toutes les espèces d'aliénation mentale; l'autre, soutenue, avec plus ou moins de rigueur, par MM. Bayle, Parchappe, Ducheck de Prague, etc., consiste à l'envisager comme une forme distincte et speciale de folie, caractérisée tout à la fois par des symptômes physiques et moraux et par des lésions anatomiques; dans la troisième, surtout préconisée par MM. Requin, Baillarger, Lemier, Hubert-Rodrigues, on confond, à l'aide du seul symptôme paralysie, les faits de paralysie générale sans délire et ceux avec délire, en une seule et même maladie, sous le nom de *paralysie générale progressive;* enfin dans la quatrième, admise par MM. Sandras, Brierre de Boismont, et Ducheune de Boulogne, on reconnait deux espèces principales de paralysies générales: la paralysie avec aliénation et la paralysie sans aliénation."

Although the progressive paralysis of the insane is something peculiar, and, in fact, unlike the ordinary forms of paralysis, which are familiar alike to the professional and non-professional observer, it is nevertheless paralysis, and I shall endeavour to point out how it is that the fact is occasionally disputed and denied. It may be, and indeed I know that it often has been, and still is, argued that paralysis is something so definite and distinct, that upon the question of its existence in any particular case, there can be no dispute; it is felt to be a matter so clear that even the doctors, with all their proverbial proneness to differ, could here find no ground for difference. We find, however, that they do, nevertheless, and it is by no means an uncommon occurrence for a medical practitioner to protest against the seeming injustice involved in the refusal to admit into a hospital for the treatment of curable cases of insanity, on the ground that there existed this peculiar form of paralysis, a patient who, in his opinion, had never manifested any symptom of paralysis at all, and whom he still believed to have the full use of all his limbs. The fact is, as already hinted, the various degrees of paralysis occurring in insane persons are peculiar to them, and even in advanced stages, are so different to hemiplegia, paraplegia, and the like, that it is not surprising they are occasionally overlooked by those whose experience has not been extended to the walls of an asylum, where the condition is unhappily too familiar to the most casual observer whose attention has once been directed to it. The earlier stages, however, are liable to be mistaken even by the practised eye; and although some may be disposed to demur to this statement, and maintain that what has hitherto been known as the general paralysis of the insane cannot be mistaken for anything else, it is pretty certain that there is a period in the development of most of these cases when the symptoms are only such as to excite suspicion, and do not justify an authoritative statement as to the nature of the case. Before any strictly paralytic symptoms have manifested themselves, there are certain indications of the coming trouble which may go on to the establishment of the disease, but which may and sometimes do subside, perhaps to return with increased force, but occasionally to cease altogether. The condition which, in fact, gives rise to the symptoms of progressive paralysis appears to be capable of arrest, although when the disease has gone on to its full establishment, there is little or no hope of averting a fatal issue. It has been already remarked that the first symptoms which are manifested are those which only justify suspicion, and perhaps not even this, until the disease has made some progress; when, in looking back, the friends are able to recal various indications of change in the temper and manner of the patient, together with failure of memory, unusual conduct, disregard of ordinary prudence, &c. These suspicions perhaps at last assume a definite form, in consequence of some serious indiscretion or forgetfulness, which sets the friends thinking, and drives them to the conclusion that there must be something wrong, and by degrees the suspicion ripens into a conviction that the mental powers have undergone a serious change. It is under these circumstances that medical advice is frequently first sought. Too frequently the ordinary medical attendant has had no experience in this peculiar class of cases, and he fails—naturally enough—to recognise the incipient stage of a malady which perhaps he has never seen; and it must be remembered that this want of acquaintance with the disease is common amongst eminent practitioners of every grade, and the consequence is that, when the opinion of a special physician is taken, the disease has too often made fatal progress, and there is little or no hope of rendering effective aid. Now it is that, tracing backwards the history of the case, it will generally be found that there has been something to exhaust or oppress the vital energies, it may be at a comparatively remote period; anxiety, violent and sudden emotion, excesses of various kinds, mechanical injury to the head, or hereditary predisposition may, alone or in combination, have been instrumental in bringing about the condition of which we are treating. Up to the period when medical aid was first resorted to, the patient may have maintained his ordinary healthy appearance, and may be still following his usual pursuits, whether of pleasure or business, and only now and then have betrayed any failure of his accustomed physical power or ordinary aptitude for business; all the animal functions may be well performed, and his family may be as unconscious as he is himself, that a fatal malady is making silent progress within him. Perhaps one of the first symptoms of approaching progressive paralysis is unaccustomed irritability of temper, followed by irresolution of purpose, failure of memory, confusion of ideas, inability to reason correctly, impetuosity of action, but facility of diversion to or from any particular course which may be plausibly suggested, whether for good or evil, but the tendency of which the patient is unable to determine by his own judgment. Under these circumstances, he becomes an easy prey to the designs of dishonest persons; he will advance money, give orders, accept responsibilities, and enter into speculations, of which he can afterwards give no account; and so I have known a fortune dissipated and a family reduced to penury, before any suspicion had arisen that one who was conducting his business, as his family supposed, with his accustomed prudence and sagacity, was, in fact, involved beyond redemption in liabilities which he had evidently accepted without any rational perception of the consequences of his acts.

Up to this time it is probable that the patient will not attempt to justify his irrational proceedings, but tacitly admit that he cannot do so. As the disease advances, however, and exaggerated notions grow into positive delusions of wealth, both in actual possession and in prospect, justification is attempted, sometimes with irritation at the suggestion of any doubt, and occasionally with so much anger and excitement that the failure of the reasoning power becomes more conspicuous. Unable to see things in their true light, he cannot understand why there should be any opposition to his views and plans, and regards it as an unjustifiable interference with his rights on the part of his family, to whom he is prone to attribute unworthy and interested motives, if he does not pity what he considers their blind perversity, in refusing to countenance and promote schemes of such vast importance as those which now occupy his mind. Sometimes the patient will press these subjects on the attention of those around him; at other times there will be considerable caution exercised in saying anything about them, as if it were a question whether others could safely be trusted with information of such moment. There appears also in some cases sufficient intelligence remaining to raise a doubt in the individual's own mind whether, after all, there is evidence to satisfy his friends about his improved prospects, and when the subject is discussed, he may really be, or at any rate, appear to be, convinced that he is mistaken; but such delusions are too fixed to be thus easily displaced, and notwithstanding all that has passed, he will maintain that his estimate of his position is correct. With these perverted notions of his real position, there is more or less restlessness during the day, and sleeplessness at night, and notwithstanding the uninterrupted persistence of the same ideas, there is an evident inability to pursue to any length an argument or an occupation of any kind. An attempt to discuss a question—even one not involving opposition to the prevailing delusions—produces excitement which soon subverts the reasoning power, and the original subject is speedily lost sight of, notwithstanding all attempts to fix the attention or bring it back to the starting-point. This incapacity to argue or reason may be temporary, and the remission may be so marked and so prolonged, that an erroneous opinion of the patient's condition may very easily be given if he is seen during one of these intervals. It is most important, therefore, to exercise caution in expressing an opinion in such cases, and care should always be taken in giving a favourable prognosis, to be well informed, and this from personal observation, of the condition of the patient at different times; the statements of others cannot be relied upon, for quite independently of any intention or desire to misrepresent, relatives are so commonly anxious to believe that there is no ground for the suggestion of mental disturbance, that they deceive themselves, and will adopt any other than this explanation of the strange conduct of a member of their family; and at the same time, this is so different to all other forms of paralysis that it is difficult to make people understand how it can be really present and they not recognise it.

Failure of memory is commonly one of the earliest symptoms of progressive paralysis, and it often occurs while the patient has still sufficient intelligence to be conscious of the defect, which at times causes a good deal of irritation and irrational anger. Sometimes he will maintain with considerable excitement the truth of a statement which it is obvious to all about him is incorrect, and it is occasionally the determination to act upon this erroneous conviction that obliges his family to subject him to some control; in other cases, the patient will be content to assert his belief, and if not opposed, will forget it, or at any rate show no disposition to act upon it. This failure of memory, in connexion with alteration of manner and conduct, should be watched closely, for it occasionally leads to very serious embarrassment of affairs. A gentleman under my care, who had become the subject of this malady, was found to have made away with considerable sums of money, and it ultimately appeared that he had from time to time rendered very generous assistance to friends and acquaintances, and entirely forgotten the particulars, being unable, in fact, either to state the amount so disposed of, or the persons to whom he had lent them without any acknowledgment or memorandum.

Persons not familiar with the progress of mental decay under these particular circumstances, will often maintain that this is not insanity, and though admitting the necessity to take care of the affairs, will insist that there is no reason to interfere with the liberty of the patient; but not only is this latter step an essential preliminary to the accomplishment of the former, but the neglect of it prejudices the prospect of arresting the disease. The freedom to pursue his own plans and carry out his own views, keeps up a degree of excitement which is most pernicious, and the attempt to divert him from his course by reasoning is altogether futile; if indeed it does not produce irritation, anger, and even violence. The transition to the next stage may be more or less rapid: the delusions become more fixed, the patient ceases to doubt; he throws off all reserve, and talks without hesitation of his unbounded means and brilliant prospects, and is impatient of any reasoning which tends to show that he is mistaken. If the delusions have reference especially to his expectations, and he does not assert his actual possession of enormous wealth, his case has arrived at its most critical period, inasmuch as it may still be regarded as curable, if proper treatment can be adopted and systematically carried out, but the difficulty of doing this is very great. In the first place, the patient is not conscious of the existence of any disease which requires treatment, or any interference with his proceedings, nor is he at all willing to admit that he is in any respect less able than heretofore to manage his own affairs. He is offended at any proposition, however cautiously put, which has for its object any kind of interference with himself personally or with his undertakings; protesting that serious injury must result from any attempt to thwart him in his plans, or to interrupt negotiations which are sure to be attended with great gain. The plausible and earnest manner in which he will urge his views and convictions is very likely to overcome the opposition, if it does not satisfy the reason and allay the fears, of his family, who, if they are not influenced by the dread of precipitating a catastrophe by determined measures, which must evidently occasion great excitement, are still deterred by their own unwillingness to admit or recognise the true nature of the case. They will gladly entertain any other view than that which is fraught with such momentous consequences, not only to the patient, but to all connected with him; for the occurrence of this disease undoubtedly presents a terrible prospect, not only as it affects the object of their solicitude himself, but from the influence which such an affliction is calculated to exert, morally and physically, on his family, and especially on his children, if he should have any. The existence of insanity in a family is looked upon as something so terrible, and such extravagant and erroneous notions are generally current on the subject, that very frequently the period during which alone there is much hope of successful treatment is allowed to pass without any use being made of it, and this because any efficient interference involves the admission that the irrational proceedings of the patient are dictated by a "mind diseased." It cannot be too earnestly impressed on the minds of those who may have to deal with these, and indeed all cases of mental disturbance, that the hope of recovery is in direct proportion to the early adoption of efficient treatment; that the time spent in fruitless hopes that the disease will be arrested by leaving it to take its own course is irrecoverably lost, and the prospect of recovery proportionately diminished. The aggravation of the symptoms which is sure to be the consequence of non-interference, might possibly be averted in an early stage of the malady, and the publicity which is so much dreaded is much more likely to be avoided, by placing the patient under control, than by leaving him to the unrestrained pursuit of his insane and ruinous projects.

But even supposing the difficulties arising from the scruples and mistaken kindness of relatives to have been overcome, there are others to be encountered scarcely less formidable. Not only are the sympathies of the public entirely with those who are, to use a common expression, "accused" of labouring under this particular affliction, as if it were a crime to be afflicted; but the prejudices of society are too often excited against those who would protect the sufferer, no less than themselves and their families, from the disastrous consequences of his insane conduct, and these prejudices become suspicions of the most unworthy kind, in reference to the motives which are supposed to influence the members of the medical profession, either in signing a certificate—an almost essential preliminary to treatment—or in taking charge of a patient, as if the moral atmosphere surrounding an individual suspected of such a degrading affliction were so pernicious that all the best feelings of human nature were at once perverted in the case of those who had to do with the sufferers, and that when the tenderest sympathies should be called forth, only the baser feelings are excited, and cold-hearted selfishness, if not wanton cruelty, takes the place of patient self-denial and disinterested devotion. It is admitted that the members of the medical profession render more gratuitous service to their suffering fellow-creatures than any other class of men, nor is it alleged against them that they grow rich upon the afflictions of others; and though liberal remuneration for professional services is not considered a crime in the performance of any other duty, it is in the medical profession if it is received for the care of an insane person. It is rare for wealth to be amassed in the practice of medicine, and there are fewer instances of competence attained in this branch of the profession than in any other, though there are melancholy instances of suffering and ruin in mind, body, and estate overwhelming men of the first eminence who have devoted their lives to the care and treatment of the insane. It is a pity, then, that any unfounded prejudices should operate to prevent the early adoption of proper treatment; and it is very much to be regretted, that the views of those in authority have tended to encourage distrust in the public mind, and as a consequence, quite unintended, led society to acquiesce in the wisdom of that dictum, which would leave every insane person at liberty who is not dangerous in the sense of personal violence, forgetting that there are dangers of other kinds affecting the patient personally, as well as those who are dependent upon him, which tend to, if they do not actually involve, ruin and absolute starvation, by the entire dissipation of the only means of subsistence of the whole family. This may not be dangerous in the strict sense of the word—at any rate, it does not appear to be so in a legal sense, though surely it is worthy of serious consideration whether the law should not interpose to save from destitution one whose mental infirmity threatens to reduce his family, it may be from affluence, to want. But to return from this digression, into which I have been led by a sense of the deep importance of early treatment.

We will suppose that progressive paralysis is not yet established, and it may be that all the symptoms hitherto manifested are not to be followed by this hopeless condition, for they occasionally present themselves as the precursors of an attack of acute mania, and consequently at this stage the diagnosis is difficult; indeed, I believe that in some such cases it is impossible to speak with any certainty as to what turn the case will take, the premonitory symptoms of mania and of progressive paralysis being sometimes undistinguishable with anything like certainty. If maniacal symptoms should now supervene, there is more ground for forming an opinion of the probable issue, because with this further development of the disease there are usually some indications which point to the occurrence of paralysis, if this is to be the result of the case. It may be, however, that the exaggerated notions which commonly constitute one of the symptoms of progressive paralysis are present only as a part of that incoherent condition which is known as simple mania, when there is not and never has been any indication of this form of paralysis; and they may exist without any maniacal symptoms, as a monomania, so to speak, with a generally tranquil and contented condition of mind.

A patient, whose paternal relations were insane, became herself insane, her malady being attributed to the death of her husband and anxiety as to the fate of two of her sons, who had long been abroad and unheard of. The first evidence of her mental disturbance was afforded by her rushing into a Jewish synagogue, she being herself a Christian, and disturbing the congregation by proposing to expound the Scriptures. She was placed under control, and after a time, becoming tranquil, returned home to see her third son, dying of phthisis. The sight of him in this hopeless condition so distressed her that she became violently excited, was again placed under control, and, with other maniacal ravings, fancied herself immensely rich, and declared that everything she saw belonged exclusively to herself. The case terminated in chronic mania, and it is to be observed that there were, in addition to the delusions of wealth, the other more usual symptoms of ordinary mania, so that no real difficulty occurred in the diagnosis. An old gentleman under my care lived to a very advanced age, peculiarly tranquil and happy in the idea that his means were inexhaustible, and that he was able to dispense millions for various benevolent purposes without sensibly diminishing his vast resources. Although, therefore, there are cases which must be included in the category of progressive paralysis, prominent symptoms of which are delusions of wealth, these alone do not constitute the disease; but their occurrence in combination with failure in the articulation removes all doubt as to the nature of the case.

The raving of mania which precedes progressive paralysis is more likely to be limited in the range of subjects than mania, which runs its course without this complication—that is to say, it is very commonly restricted to the extravagant and exaggerated notions of wealth, power, and personal strength, &c., which generally become marked symptoms of the disease in a more advanced stage; whereas in simple mania the patient wanders wildly, rapidly, and incoherently from one subject to another, with less disposition to give special prominence to any one, and when this is the case it is not usual to find that wealth is the prominent subject of these incoherent rambles; such cases, however, do occur, but when they have proceeded thus far there are generally some other symptoms which will assist in forming a diagnosis.

Statements differ a good deal as to the order in which the various symptoms of progressive paralysis present themselves, and also as to the particular parts or muscles first involved. This difference arises from the fact that the course of the disease is not uniform in different cases; in other words, there is an uncertainty as to what parts will be first involved, and when the disease is established beyond question, sometimes one and sometimes another set of muscles is most implicated. The one symptom which is of all others the most diagnostic, is the imperfection of articulation; this appears in some cases to be principally dependent on the loss of co-ordinate power in the muscular structures of the lips; in other cases the tongue is most at fault; and in some cases the seat of mischief seems to be still nearer to the origin of the voice; occasionally, and indeed generally in advanced stages of the disease, all these parts are involved together; not a word is distinctly, and scarcely a word is intelligibly, articulated. One of the most simple forms of this imperfect articulation is that in which the lips, being no longer under perfect control, have not their accustomed power to regulate the degree and continuance of their separation and closure. Under these circumstances the patient experiences difficulty in getting out without interruption certain sounds which depend upon the integrity of the muscular power in these parts, and it will sometimes require a considerable effort to force out a labial sound, the lips, as it were, sticking together, and the word being ultimately blown out after ineffectual endeavours to bring it out smoothly. The difference between this and similar hesitation in the majority of cases of ordinary stammering, appears to be the difference between a mental or functional defect and one more essentially physical. I know that exception will be taken to the proposition, that stammering is in any sense a mental defect or infirmity; and the belief now generally adopted, that all functional disturbance is owing to physical change, constituting, in fact, disease, inasmuch as it is a departure from the healthy condition, will be opposed to the view that it can be functional as distinguished from physical. But it must be borne in mind that most stammerers, besides being curable, are enabled, by means of certain methods or devices, so to speak, to bring out sounds which under ordinary circumstances they can never utter without more or less difficulty or hesitation, the principle involved in these methods being to take off the attention from the attempted utterance, and it is such cases, the failing appearing to be in the mental operations, that we are disposed to call functional. For example, it will often happen that an individual is unable to utter a dozen words, or read two lines in the most familiar book, without stammering; but if, instead of leaving him to get out his words as he can, he is made to speak slowly and in measured time—as, for example, to the beat of a metronome—he will be astonished to find how much of his difficulty is at once overcome. It may be necessary to commence with a very slow beat, so that the words are uttered at long intervals, and in severe cases it is well to divide every word into syllables, one syllable only being uttered with each vibration of the pendulum; as the facility of utterance increases, the beat may be quickened, long words being pronounced at once without difficulty or hesitation, until the patient is able to read without faltering. It is presumed that the success of this method depends upon the manner in which the attention of the individual is divided, instead of being concentrated on an extraordinary mental effort, directed solely to overcoming a conscious difficulty, which concentration of attention is, in fact, a frequent cause of stammering. In such cases of ordinary stammering, the failure appears to be in the mental operations, which do not result in proper control and direction of the action of the muscles concerned in the production of speech, these muscles being in themselves able to perform their functions if properly controlled and directed; whereas in the hesitation of speech, which forms one of the symptoms of progressive paralysis, it is the muscles themselves which are involved; and that this is the case, and that the failure does not depend so much upon any mental irregularity, is proved by the fact that no method of diverting the attention will enable the individual in these cases to overcome the impediment. It is occasionally found that a stammerer can speak extempore without hesitation, who fails in ordinary conversation and also in reading. I knew a clergyman who was unable to read the prayers in consequence of hesitation in his speech, who, however, was regularly accustomed to preach extempore, though he could not do so from a written sermon. In this case the defect must have been in the mental operations, and not in the muscles themselves, which were proved to be competent for the performance of their functions if properly directed and controlled. It is not necessary to dwell at any length upon the difference between the hesitation of speech occurring in ordinary stammering and that which attends the development of progressive paralysis; it is indeed impossible by any written description, however elaborate and minute, to convey to the mind an accurate notion of that which is immediately recognised by the eye, and the difference in this case can scarcely be overlooked when it has once been pointed out and appreciated, for independently of all other distinguishing marks, the general mental condition will indicate the true nature of the impediment. Thus in common stammering the endeavour to overcome the difficulty partakes more of the nature of a general effort, the will and not the muscles of speech being apparently at fault. In the hesitation of progressive paralysis, the hesitation is more evidently local, depending upon muscular paralysis of the parts concerned in articulation. In the former case there is more contortion of the features, the effort being greater to regulate the will than in the latter case, where the failure of the mental powers incapacitates the individual for the exercise of any powerful and well-directed volition; and again, ordinary stammering has existed previously to the appearance of any mental derangement, so that the history would of itself determine the nature of the case, and this helps to make the difficulty of articulation the most important of all the symptoms of progressive paralysis, for its presence is the surest guide to a correct diagnosis, and a very little experience will enable the practitioner to recognise it without hesitation.

I once saw a patient in whom the hesitation of speech was very remarkable, and who had very much the appearance of a person suffering from chorea, for it was not only the mouth and lips that were affected, but all the muscles of the face, and these were continually twitching; he was at the same time feeble and out of health. Such a case, if only seen once, might very easily be mistaken. A month after I first saw him he had been getting gradually more shaky, and the paralytic symptoms had developed themselves in a marked manner; the hesitation of speech and difficulty of distinct articulation had much increased; his gait was very uncertain, and he had more than once fallen, from simple inability to maintain the erect posture. He had many delusions, all of an exalted character; said he had plenty of money, and was going to marry the Queen.

Different observers have given different accounts of the order in which the various parts concerned in speech are affected in progressive paralysis, and also of the particular conditions observed. These differences I believe to be owing more to the varieties which occur than to errors of observation. Some of these cases will present symptoms which are wanting in others; in one the upper, in another the lower, lip seems to be the more affected; sometimes the tongue, and sometimes the other muscular structures of the mouth are least under the control of the will. Perhaps the most frequent appearance of the mouth is a certain tightness or compression of the upper lip, as if conscious of a want of control over these parts; the individual made an effort to maintain a fixed point, from which the other muscles might the better act. The lower lip quivers very much in the same manner that it does in the effort to control passionate emotion, and the degree of contact which ought to be effected and broken alternately with the upper lip cannot be maintained. The difficulty in articulation, when the lips are the chief seat of the malady, will be manifested in the utterance of labial sounds, words beginning with b, m, p, and also with w, being especially difficult to produce; there is either quivering uncertainty or a more or less forcible expulsion of the sound, which is blown out, as it were, through lips convulsively closed, the ill-directed effort to regulate the degree of approximation or separation resulting in a sort of spasmodic closure, so that the sound is delivered with uncertainty, or for the time altogether impeded, and at last blown out with an effort. If, therefore, by a person whose mental condition becomes the subject of inquiry, questions are answered with quivering of the mouth, or with an obvious inability to regulate the approximation or separation of the lips—or, in other words, to adjust with nicety the oral opening—the individual having no previous impediment in his speech, there will be something more than suspicion that progressive paralysis is the cause. This form of impediment, perhaps the most frequent, is also the most easily observed, for the eye as well as the ear will assist in recognising it; but syllables and sounds produced by the other parts of the mouth and tongue, including guttural sounds, will also betray the fatal impediment with scarcely less frequency, and there is often a convulsive movement of the lips and cheeks, occasionally extending to the other muscles of the face, in the form of what would be called nervous twitchings, quite distinct from anything that would be observed in ordinary stammering. As the disease advances, the difficulty of articulation increases; words which hitherto have been produced distinctly are pronounced with uncertainty, and at last unintelligibly, so that in many cases before the fatal termination is arrived at, the individual has ceased to be able to express his wants, if indeed he is conscious of any. Even from this condition a patient will sometimes rally so far as to be again able to articulate intelligibly, and may go on for months without any urgency in the symptoms, which, however, are only in abeyance. Sooner or later, sometimes with scarcely any interval, and rarely at a period so much as twelve months delayed, a condition of still greater helplessness than before is established; the patient is still more lost, and a final breakdown seems inevitable; but again and again he will rally, now and then to a condition which is some improvement upon his state just before the last relapse; and those who are not familiar with such cases will very likely conclude that such amendment must surely be the prelude to recovery. It is not really so, however; the former symptoms, perhaps with new complications, are established; there is less power of volition than ever, and this state proceeds more or less rapidly to coma, from which the patient may not again rally, but sink without any further manifestation of consciousness.

Concurrently with this failing in the articulation is observed loss of muscular power in other parts of the body, there is increasing difficulty in regulating the movements of the limbs, and in appreciating the distance of objects, the patient becomes unable to put forth his hand to the exact spot he aims at, and his hold is uncertain and occasionally somewhat spasmodic; the same thing, but in a more marked degree, occurs in the lower limbs, the gait is unsteady and uncertain, the patient endeavours to maintain his equilibrium by walking with his legs more or less widely separated, but withal there is a steadiness which is altogether wanting in the reel of the drunkard to which this unstable gait has been compared.

In the progress of these cases convulsive attacks are by no means unfrequent, sometimes so slight as scarcely to be noticed, consisting of little more than irregular twitchings of the face or limbs, during which the patient may possess sufficient power of volition to maintain the sitting posture, at other times so intense that he falls senseless, and sometimes continues for hours intensely convulsed, the muscles acting so spasmodically that the nostrils are occasionally drawn in with such force that the nasal apertures are completely closed, and would effectually prevent inspiration by the nose if they were not mechanically dilated. On one occasion, when I was hastily called to see a patient in this condition, I arrived just in time to prevent suffocation by promptly passing a pencil-case (the object nearest to hand) into the nostril, and so keeping it dilated until the intensity of the attack had passed; the mouth was spasmodically closed, and every effort at inspiration was made so spasmodically, that the nostrils were immediately drawn inwards with such force as completely to prevent the passage of air into the lungs.

These convulsive attacks differ essentially from epileptic seizures, although in some respects there is a degree of resemblance between them. The mental powers of the patient are already so seriously compromised, that there is no possibility of ascertaining whether there is ever any warning which is appreciated and recognised as such by the sufferer. The access of the attack is neither so sudden nor so violent as in epilepsy, and the convulsions attending the unconsciousness, which is apparently perfect in both, are less violent than in epilepsy, though not less intense and terrible; there is rarely foaming at the mouth or biting of the tongue, but frequently a forced or what might be called an explosive expiration, which is very characteristic, air being blown out of the mouth through lips which are closed spasmodically; with this air there is usually some saliva, but it is not worked into foam as in epilepsy. These attacks are sometimes so slight that the patient may retain the sitting posture, and only exhibit some spasmodic twitchings in the face or limbs; at other times he will fall to the ground, as if deprived somewhat suddenly of the power to maintain the erect posture; but from this he may speedily recover, and immediately appear as if nothing had occurred. Again, there may be a sudden convulsive movement, which deprives the patient of volition, and renders him helpless and apparently unconscious, with but slight general disturbance; and this passes off, leaving no traces of its occurrence. Then, again, there are still more severe attacks, which are attended with violent convulsions, and peculiar contortions and catchings of the face. These vary in duration, sometimes being of short continuance, at other times lasting for several hours. The insensibility may continue two or three days; but in this case the patient very rarely—I might almost say never—rallies again, there being in fact no return of consciousness. Instead of the congested state of the face which occurs in epilepsy, the patient in these attacks is pallid, livid, and ghastly, and the convulsive movements are more like those excited by galvanism in a corpse than the violent struggles of the epileptic, which appear almost as if they involved a degree of volition exerted to shake off some frightful malady of which the patient had a sort of consciousness. I do not pretend to say that there is either consciousness or volition in the true epileptic seizure; I wish only to convey the idea of what is the appearance of the patient during the attacks which are common in progressive paralysis. The convulsive movements already referred to prevail for a time, and are followed by intervals of passive coma, the eyes being closed, the face and limbs occasionally twitching, the inspiration deep but scarcely stertorous, the pulse accelerated but not remarkably deficient in power, the surface generally colder than natural. The pupils are sometimes contracted, but most frequently dilated, and often irregular. This dilatation of the pupil has been by some considered an invariable symptom of this disease, but such is not my experience; it undoubtedly is very frequent, but I have seen many cases in which there was nothing remarkable in the state of the pupil, which was natural in appearance and in its action under the stimulus of light; but I have met with a few cases which I have not seen described by any writer on the subject, in which the iris during these convulsive attacks was itself the subject, of irregular and spontaneous contractions. The following extract from the notes of a case under my care will best illustrate what I wish to describe:

> "A female, aged thirty-seven, married, without family, temperate, supposed cause uterine, general health good, no hereditary predisposition, attack commenced five weeks ago. She is depressed, restless, and haunted by imaginary fears, and there is some slight impediment in her speech, her gait is unsteady, and there is a degree of uncertainty in almost all her actions and motions."

Note on the fourth day:

> "There has been no particular change in her symptoms, except that she is more restless; but this morning she suddenly became excited and violent, rushing wildly about, imploring mercy, and tearing her hair. It required great efforts to control her and prevent her doing herself some serious injury, and it was in vain to reason with her and assure her that nothing should be allowed to harm her. The following day the excitement continued, though not quite so great; but she had a fit, in which she would have fallen to the ground if she had not been supported by the nurse, who saw the attack coming on. She appeared to be perfectly insensible and unconscious while there were regular convulsive movements of the different parts of the body, and occasionally twitchings of particular muscles, with intervals of rest, during which she lay motionless for a few seconds without any rigidity, and then the twitchings and irregular convulsive movements returned. The pupil was attentively observed, and was distinctly seen to contract and dilate irrespective of the application of light, and without the position of the eyeball being at all altered; at the same time it was sensible to light, and contracted whenever that stimulus was directly applied. The movements of the iris, which were spontaneous, or, in other words, not depending upon the application of the stimulus of light, were frequently irregular, so that when contracting or dilating, instead of remaining circular, it presented in outline something of the appearance of a transverse section of an irregular multilocular cyst or pericarp, at other times assuming an irregular ovoid form. Now and then she would recover sufficiently to ask questions, and was after a short interval seized with another attack."

The following day, when there was no fresh attack, the pupils were both irregular, the left the more so, the mental state and the condition of the patient generally being about the same as before the attack. In the most severe form of these attacks there is not the same violent kind of spasm which in epilepsy so commonly hurls the rigid body of the patient forward, dashing his face upon the ground or against any object that may happen to come in the way; and in the less severe forms the patient will sometimes make an effort to save himself from falling, showing that consciousness is not always lost in these attacks.

Whatever injury is received by falls or other violence, it is remarkable that they do not appear to cause pain to the subjects of this form of paralysis, which evidently involves sensation; and though diminished sensibility is commonly observed amongst the insane, it is more conspicuous in this than in any other form of the malady. An important point has been established by Dr. Bucknill in reference to the excito-motory sensibility in these cases; he has found it to be considerably diminished, and sometimes almost abolished. I have had the opportunity to verify his observations on this subject, but I have found this power in a great measure restored during the intervals of remission, which are not unfrequent, being again diminished as the symptoms become again urgent. As in epilepsy, these attacks are frequently, though not so generally, followed by a disposition to sleep; but it appears rather the sleep of exhaustion than the comatose condition which follows, and seems, in fact, to be a continuation of the epileptic seizure. When the disease has proceeded to such a point that the intellectual faculties are seriously compromised, the patient, still under the influence of its characteristic delusions, will attach extravagant value to worthless objects, and collect rubbish, stones, or any scraps or articles which come in his way, and will declare that they are possessed of fabulous properties and worth; for the same reasons he will cram earth or mud into his pockets or about his person, quite satisfied that he is treasuring up things rare and precious. This propensity to hoard rubbish is not peculiar to progressive paralysis, nor is it even in this disease always indulged under the idea that the objects collected are valuable, but occasionally as a mere freak of restless michief. Sometimes there is more or less of maniacal excitement throughout; at other times there is rather a passive condition, the patient contenting himself with talking of his grand projects and vast means, but manifesting little or no inclination to complain of any control that may be exercised over him. The maniacal excitement may be in connexion with either the elated or the melancholy form of the disease; in both cases it is a serious complication, in the latter especially, for it often gives rise to unfounded complaints of ill-treatment on the part of those having charge of the patient, in consequence of the readiness with which the skin is bruised, this no doubt being owing to the low state of vitality of the tissues generally, which break down under very moderate pressure; and this cannot be avoided, for personal control is often a matter of necessity in attending to cleanliness and the administration of food. A still more serious difficulty in such cases arises when the patient refuses nourishment. This is not at all unfrequent, and often occurs when the powers of the system are well nigh exhausted. It is a nice point to determine how far total abstinence may be permitted, the alternative being violent struggles to prevent the employment of the stomach-pump when all other means of introducing food have failed. This excitement can only tend to exhaust what little strength remains; and yet it is clear that there is no alternative between forcible employment of the stomach-pump and allowing the patient to die of starvation. The former, therefore, becomes imperative, and it is well if the condition of the patient, as regards his conduct, will permit its use twice in the twenty-four hours. I have had many cases in which I did not feel justified in subjecting the patient to what really becomes a terrible ordeal under these circumstances more than once a day, and I may here say a word upon the manner of using the stomach-pump, a proceeding sufficiently rare to be entirely unknown to many members of the medical profession, though assumed to be familiar to all, and therefore never described. It is not that there is any difficulty in the employment of this apparatus under ordinary circumstances, but the occasions to which I am referring are extraordinary, and I have myself felt considerable anxiety when I have found a patient with the tube in his stomach turn as black in the face as if about to be suffocated, from what I believe to have been the undue pressure of the tube upon the glottis, caused by the patient's struggles. In such cases I have found it better to pass a tube by the nose rather than by the mouth; the only objection is, that the tube being necessarily smaller, more time is required to introduce the same quantity of food, and where seconds are of importance in the duration of the excitement, this is an objection; but it is more than counterbalanced by the greater safety of this route, as compared with that by the mouth. I do not think any circumstances justify the course which used formerly to be adopted, of punching out some of the teeth to obtain admission for the tube into the mouth. I never met with a patient whose mouth I was unable to open, and in what is called the criminal department of Bethlem Hospital I have had to deal with some of the most savage and doggedly sullen specimens of the human race, who have, with a resolution which nothing could shake, and which I believe would not have failed under piecemeal mutilation, determined to starve themselves as the only escape within their power from the most gloomy fate to which human beings can well be subjected. But the force required to open a mouth so resolutely closed risks some damage to the soft parts of the mouth, and should therefore be avoided by making use of the nasal route. Wherever the opposition of the patient can be overcome without much difficulty, I should always prefer the mouth, as admitting of a larger quantity flowing into the stomach in a short time, and also as exciting more salivary secretion, and so obtaining the most favourable conditions for the digestion of what is taken. Having determined the most eligible route, the next consideration is the kind of instrument to be employed. The general rule that the simplest is the best finds no exception here. I would avoid all complicated apparatus, which not only is so apt to be out of order at the moment it is wanted, but which also requires more time for its employment. Next to the simple elastic bottle, which is easily emptied by the pressure of the hand, and which, having a canal of uniform calibre through the stopcock, is, I believe, the best, comes the reservoir-pump, into which, as in the elastic bottle, the whole of the food to be administered is placed beforehand, and forced out by one forcing down of the piston. This is apt to get out of order; besides, it does not permit nourishment of such consistence to pass as the simple bottle; and the thicker this can be made the better, for it is always well to add some farinaceous matter to the fluid ingredients usually employed, consisting generally of beef-tea; and as this is the only opportunity of administering food and medicines, including stimulants, the occasion must not be neglected; wine, brandy, tonics, sedatives, and purgatives may all be included from time to time, as the symptoms seem to require them. The manner of introducing the tube, and the position of the patient at the time, are important. If there is no very determined opposition, it is still prudent to guard against a sudden outbreak on the part of the patient, who should be placed in a strong chair (I have seen many ordinary chairs broken during the operation), but not what is called an easy-chair, for the back of it would be in the way; an attendant standing behind places his open hand, or, if necessary, both his open hands, over one another across the patient's forehead, and presses the head firmly against his own chest. The operator having placed a smooth-turned stick of boxwood having a small knob at the end between the teeth, gives it in charge to an assistant, who, grasping it firmly, holds his closed hand close to the side of the face; and in this position there is no danger that the patient will get either the tube or the finger of the operator between his teeth, as he would otherwise be likely to do. The tube now passed directly to the back of the pharynx, readily receives any requisite inclination from the forefinger of the operator's left hand, and the tube with very slight pressure passes into the stomach. When the general struggles of the patient are more unmanageable than the closure of the mouth, they will be most readily controlled, and with little risk of bruising, by rolling him up like a mummy in blankets, the arms being first placed straight down by the sides, and the blankets wound pretty tightly round him in the manner of bandages; in this condition placed on a mattress on the floor, there is no danger of any injury being inflicted. The only remark that it is necessary to make in reference to the introduction of the tube by the nose, is suggested by my having seen ineffectual attempts made to force it *up* the nose, the direct passage to the throat by this channel being along the floor of the nasal cavity, so that the tube should be passed directly backwards, with a slight inclination downwards rather than upwards. I believe that in the natural state of the parts it is impossible for the tube passed by the nose to get into the larynx, and that it is very improbable if passed by the mouth; but it is pretty certain that *if* it did the fact would immediately be made known by the impediment to the respiration, and with any ordinary observation of what was going on it would be impossible for anybody to force food into the trachea, cases of which are said to have occurred. These details may seem to be out of place here; but it must be borne in mind that the prolongation of the patient's life, which is the first paramount duty of his medical attendant, is involved in this question of feeding; and though it may be assumed that the proceeding is familiar to all, my experience has shown me that such is not the case, and that many most intelligent practitioners have never used the stomach-pump nor seen it employed. The loss of the excito-motory power, which has already been noticed, becomes of vital importance in relation to the act of swallowing, which is sometimes in these cases performed with considerable difficulty, and occasionally cannot be performed at all; and a question arises, which has been differently answered—viz., What is the cause of the suffocation which now and then suddenly terminates the life of the patient during the progress of a meal? Some have thought that death in these cases is produced by the impaction of food in the pharynx pressing on the windpipe; others, that it gets into the larynx itself. I have no doubt that the latter is the true explanation, excepting where the mass is of sufficient size to completely block up the entrance to the larynx without actually passing into it. The practical value of this conclusion is this, that valuable time will not be wasted in persevering attempts to get rid of the obstructions by means of the probang, but prompt measures will be taken to get air into the lungs by means of an opening in the trachea.

In addition to the want of attention to personal cleanliness which so frequently characterizes the advanced stages of this disease, there is one point which is apt to be overlooked. A patient may be observed to be continually wet from the involuntary discharge of urine, but in all such cases it will be well to ascertain that the bladder is not distended, for there is danger that it may burst if anything should occur to interrupt this escape, which is simply mechanical, from over-distension, and not the result of muscular contraction.

When the disease has advanced thus far the patient soon loses the ability to move about, to support himself in the erect or even in the sitting posture, he takes to his bed for the short remnant of animal life that remains to him, and he sinks into the most deplorable state of helplessness; the sphincters no longer able to perform their functions, the vital powers so low that there is sloughing of the parts which are subjected to any pressure, while reason is annihilated and voluntary power almost abolished, the only evidence of it, excepting, perhaps, the unsuccessful efforts to speak, being the opening of the mouth to receive any quantity of food. It is perhaps owing to the fact, that patients under these circumstances commonly retain a ravenous appetite almost to the last, that life is prolonged under circumstances that seem to be inconsistent with its continuance. The pulse is generally soft, full, and but little increased in frequency excepting during the convulsive attacks which have been described. So long as the patient is able to utter a word intelligibly, he will, in answer to a question, say that he is quite well, very happy, very rich, and anything else in the superlative degree that may be suggested to him; he seems to be quite unconscious of any suffering, and if his vacant countenance can be said to indicate emotion of any kind it is certainly pleasurable, very often decidedly so. Statements differ as to the duration of this disease; the general opinion is, that such cases rarely last more than two years when the disease is fully developed; exceptional cases however occur where the symptoms are not very well marked, where the patient survives for a much longer period. The development of the malady is sometimes rather sudden, but more frequently its approach is gradual. The causes are various, and include joy, grief, anxiety, excesses of every kind, including over-work, bodily illness, mechanical injury, in fact, anything which exhausts the nervous energy, and hereditary predispotion. In one case which came under my observation, the cause was thus stated :—The patient, after being some time out of employment, obtained a situation in which he gave so much satisfaction to his employer that his salary was doubled in a month, and he was so rejoiced at his good fortune that his mind began to suffer immediately, and from that time he was useless to his employer, sometimes spoiling a quire of paper in writing a short note. The symptoms of progressive paralysis which were present when I first saw him, continued steadily to increase, and he died about thirteen months from the commencement of the attack. Towards the last, "it was with difficulty that he was able to articulate distinctly enough to be understood, and when asked how he felt, said he was very well, very strong, very happy, and very rich ; when asked if he could walk, he said, or rather spluttered out 'O yes,' though in reality he could scarcely move a limb or utter a distinct word ; this was his last attempt at speaking, and he died a few hours afterwards."

In another case, where embarrassment was the cause of the attack, some of the early symptoms of the disease were well marked. Though in fact insolvent, he believed himself to be very wealthy. The following note of the case was made about a month after the commencement of the attack :

> "With the repeated assurance on his part that he is quite well, there appears yet to be a consciousness that something about him was not quite right, and he was accordingly most anxious to appear to the best advantage ; but still he was irritable, and even abusive, if any question were asked which seemed to involve a doubt of his perfect health, both mentally and bodily, and as if afraid of committing himself, he hesitated very much to enter into any discussion, or give any account of himself or his prospects ; when, however, he was cautiously pressed, he stated that he had vast resources. The speech is evidently affected, but not to any considerable extent, the upper lip being compressed, while the lower one quivers whenever he attempts to speak."

One of the worst cases of this disease which I ever remember to have seen, and which was attended by frightful convulsive attacks, was caused by extreme devotion to the duties of his position as an agent, involving great labour and anxiety. Injuries of the head have, in several cases which have come under my observation, been followed by this disease ; occasionally there has been a considerable interval between the receipt of the injury and the development of these particular symptoms ; but during this interval there has been a sensible alteration in the conduct of the individual, which has served as the connecting link between the cause and the effect. When progressive paralysis is a consequence of intemperate habits, the break-down is more likely to be rapid, and some of the peculiar symptoms less marked, the prominent feature being prostration of the vital powers, with loss of voluntary motion. In one such case under my care there did not appear to be any particular delusion, but the patient spent money in great profusion, and her conduct generally was characterized by pride and extravagance.

Progressive paralysis occurs much more frequently in the male than in the female sex, and amongst the latter there is, according to my experience, a large proportion of cases of what may be called the melancholic variety.

The disease most likely to be confounded with progressive paralysis is dementia, and the symptoms of the two have in many respects a certain resemblance, especially at their commencement and termination. The history, if carefully traced, will very materially assist the diagnosis, and it is not often that the faculties are so continuously dormant as to mislead a practised observer. Sometimes, however, a patient is first seen in an inert condition, presenting all the appearance of ordinary dementia, having already passed through a state of more or less excitement, and to an ordinary practitioner it may never have occurred that, in addition to these symptoms, which are patent to everybody, there are others pointing to a speedily fatal issue which are not prominent, and may remain undeclared unless sought for with a previous knowledge of what may be found under such circumstances. For instance, a gentleman now under my care presents in all respects the condition of a patient suffering from dementia; he stands or sits staring vacantly, and if taken by the arm will walk without any other manifestation of volition than what is involved in putting one leg before another mechanically; if asked a question, he will perhaps incline his face or direct an unmeaning gaze to the speaker, who might very naturally conclude that it would be useless to persevere in the attempt to obtain an answer from one apparently so incapable to comprehend anything; but an answer may be obtained, nevertheless, by continued efforts to rouse the attention, and then the true nature of the case becomes apparent. The few words that are uttered are produced with considerable difficulty, all the muscular structures of the mouth being apparently involved, and their irregular action very marked. Sometimes when unable to articulate a sound spontaneously, a patient will endeavour to imitate the movements of another mouth, and so copy the words suggested. I have never seen this in dementia, and besides, whatever the present condition, the history of the case will probably tell of a recent period when there existed extravagant notions of wealth and capabilities which have become extinguished by the advancing disease, which is obliterating the mental faculties at the same time with the physical powers. The general health continues tolerably good, that is to say, the animal functions are well performed, the appetite is good, the pulse, though somewhat accelerated, is yet not different to what is commonly found in perfect health; the patient sleeps well, and is evidently quite unconscious of suffering any ailment, but on the contrary, says as distinctly as he is able, that he is quite well. Although there is at times entire vacancy in the expression of the countenance, or more correctly, an absence of any expression at all, there is less change of features than is observed in ordinary chronic dementia, which has gone on to the extent of rendering the individual helpless for the performance of all the duties of life, and for any attention to his personal wants. Although in chronic dementia a patient may experience an occasional access of excitement, this comes as an aggravation of his lost condition, and there are no variations which can be regarded as evidence of a tendency to improve. In the condition resembling dementia, which forms the advanced stage of progressive paralysis, there are frequently variations which are apt to deceive the inexperienced, and raise hopes which are sure to be disappointed. The most urgent symptoms are so far alleviated that the patient is again able to understand what is said, to answer a question rationally, to attend more or less intelligently to his personal wants, and to take notice of and even some interest in what is going on around him, and this improved condition may continue for many weeks, the imperfections of speech and gait, however, remaining, though in a less degree, until another change occurs, and all the former symptoms are re-established as distinctly as ever. In chronic dementia there seems to be a permanent change in the brain, which is not susceptible of amelioration; in progressive paralysis, the pathological condition, whatever it is, admits of only temporary remission, and accordingly a change which astonishes everybody sometimes occurs, which restores a patient, to all appearance moribund, to a condition which is really a marked improvement upon his state a few days previously.

The pathology of this disease is enveloped in the same mystery as all other affections of the nervous system, and although the views of M. Calmeil, that it depends upon chronic inflammation of the membranes, sometimes involving the surface of the brain, are entitled to the greatest respect, and are by some considered as the most probable explanation, there is still this difficulty—viz., that the same post-mortem appearances which are observed here are found in other affections of the nervous system where the peculiar symptoms of this disease are altogether wanting; and again, those which are noted as specially indicating the existence of disease during life, are sometimes represented by changes of the opposite character. I believe there is no pathological change hitherto recognised and supposed to belong specially to this disease, which is not found in connexion with totally different symptoms—e.g., of all the morbid appearances observed after death, perhaps the most frequent is increased fluid in the ventricles, infiltration of the pia mater, and opacity of the arachnoid. All of these are commonly found when no symptoms of this malady have been manifested during life. Again, various degrees of softening of some portion of the brain have been frequently found in those who have been the subjects of progressive paralysis, and has been supposed to be in some way connected with the disease as a cause; but then again, the opposite condition of induration has been found in the same class of cases. Dr. Boyd, in his valuable reports of the Somerset County Asylum, has given the particulars of several such cases where the brain was unusually firm, the degree of firmness, in fact, sometimes amounting to toughness. It seems impossible to accept any explanation of the symptoms which has yet been given in the face of such facts as are above referred to, resting as they do on undoubted authority. We must, I think, admit that the subject is still shrouded in mystery, and that Dr. Bucknill is right in saying that the pathology of the disease is yet purely a matter of surmise; but this much appears clear—viz., that it is essentially a disease of nutrition, and that it depends upon some altered condition of the nervous system, which admits of temporary remissions. If this be so, the principle of treatment is already indicated, and my experience leads me to the conclusion that whether we regard the pathological changes as resulting from inflammatory action or not, we must support the vital powers, and this especially by means of stimulants. I have been in the habit of administering these freely, having regard only to the effect produced, and not at all to the quantity given. Of course I would not be understood as advocating the indiscriminate and reckless employment of stimulants in this or any other disease, but I am sure I have again and again seen life prolonged by the liberal use of wine and brandy. Morphia in the early stages, in combination with stimulants, I have given with great advantage. Mercury has been recommended, both in the form of calomel and bichloride, but I have little experience and less confidence in this treatment. A few leeches may occasionally be admissible, applied to the temples when there is an appearance of unusual congestion about the head, which is sometimes the case; but these cases are quite the exceptions, and relief may generally be obtained by proper attention to the bowels. Blisters and other forms of counter-irritation I have frequently found of essential service, and these may be repeated in pretty quick succession—in fact, almost as fast as they heal, if there be occasion for them, and the patient is well supported at the same time. Nourishment, which is a most important element of treatment, especially when the case has reached an advanced stage, should be carefully prepared, and never left to be taken by the patient alone, for the ravenous appetite which so frequently attends this disease will often lead him to cram into his mouth at once not only any quantity of solid food, but other substances which come in his way, such as coals, cinders, and even his own excrement. It is well that food should be reduced to something like the consistence of pulp, and dry bread as such, crumb as well as crust, should be dispensed with, but crumbed into food in a fluid or semi-fluid state, it is an important addition to a meal. There is frequently great torpor of the bowels, which I much prefer to deal with by enemas than by purgatives taken into the stomach, where this can be accomplished. Independently of any difficulty there may be in administering medicine by the mouth, such doses are uncertain in their action, and after one or two repetitions, rendered necessary by the failure of the first and perhaps the second, the action is liable to be excessive, and I believe has occasionally turned the scale against the life which was trembling in the balance. The last complication in the course of this terrible malady is when the patient is no longer able to maintain the erect or even the sitting posture, and the parts which have to support the weight of the body, deprived of their already diminished vitality by the pressure to which they are subjected, become inflamed, and ultimately slough. This must tend to hasten the fatal issue, but it may for a time be averted by great attention to cleanliness, and by keeping the patient as long as possible in a position between sitting and lying, which may be accomplished by means of a chair so constructed (the back bearing the same relation to the seat that it would in an ordinary easy chair) that it is altogether tilted backwards, and a great part of the weight of the body is borne by the shoulders and back, the pressure being taken off the bottom of the sacrum by means of a vacant space left between the rail at the bottom of the back of the chair and the rail at the most posterior part of the seat of the chair, so that, in fact, the patient sits in a hollow, and the parts most prone to suffer are not subjected to any pressure while the patient remains in this position.

The object which I have here proposed to myself has been to communicate the result of my own experience without attempting to decide disputed questions. It is unsatisfactory to reflect how little I am able to add to what is already known of this terrible malady, under which human nature appears in its most humiliating aspect, but I shall hope to have put in a somewhat clearer light than it has yet appeared to some of my readers the characteristic features of the disease, and trust that advancing science will enable us to take a more correct view of its nature, and to deal with it more successfully than we have hitherto done.

Art. II.

On the Pathology of Chorea. By Francis T. Bond, M.B., B.A. (Lond.), late Physician to the Queen's Hospital, Birmingham.

Whilst recently engaged in examining the literature of chorea for some information on features of that disease which had excited my attention, I was somewhat surprised at the incomplete and unsystematic manner in which its pathology was generally discussed. There rarely appeared to be any attempt to explain the phenomena of chorea by a reference to the recent results of physiological and histological investigation, or to the now generally recognised views as to the nature and relations of the different varieties of nerve force. Nor was there much disposition to base the therapeutic measures recommended for the relief of the disease upon a rational statement of its pathology. I am induced, therefore, to draw attention to some considerations which may possibly serve to connect under a common head the scattered facts with which the various treatises on the subject abound, and may help to form a basis upon which to erect a more perfect theory as to the pathology of chorea than at present appears to exist. In order to make these considerations more clear, it will be desirable briefly to recapitulate some points in the physiology of nervous actions, upon an acquaintance with which the due appreciation of the nature of this disease intimately depends, but which do not seem to have attracted the notice of writers upon it.

All muscular movements in man are either voluntary or automatic; those which are automatic being performed in virtue of what is called reflex nervous action, and involving the agency of a central reservoir of nerve force, a sensational impulse communicated to that centre, and a motorial one emanating from it. Automatic actions may be either independent of, or associated with consciousness; where they are not accompanied by consciousness, they probably only involve the agency of the spinal cord,* or the ganglia of the sympathetic system; where they are, the stream of nerve force which produces them must pass through the sensorium or centre of consciousness, which there are good grounds for supposing to be seated in the cerebral ganglia.† The faculty of the will, which is superior to and distinct from consciousness, is not exercised in the creation of nervous impulses, as is generally supposed, but in the direction of those which are conditioned by the external phenomena of nature, or by the internal ones of our own mental economy. Hence it comes to regulate and control many movements which are essentially automatic in their character, and which exhibit themselves as such when the power of the will is withdrawn, with as much clearness as others over which the will, even in its most active state, has no influence at all. "Automatic," "instinctive," "involuntary," or, as they have been called, "reflex" movements, are induced, as has been stated, by the influence of a sensational impulse upon a nervous centre, from which a motor impulse is transmitted to the muscles of the part acted upon. Such centres are found in the ganglion cells of the spinal cord, as in the reflex movements of many of the lower animals, and in those which may be excited in the lower extremities of a paraplegic man; in the medulla oblongata, as in the movements of respiration and circulation in the higher animals; or in the sensory ganglia proper, as in the movements excited by the influence of stimuli transmitted from the organs of special sense, or of ideas proceeding from the grey matter of the cerebrum. Where the sympathetic ganglia act as centres of reflex action, their sensory impulses are probably derived from the bloodvessels and viscera to which their nerves are distributed. With regard to the immediate nature of the sensory impulse in these several instances, it may consist (1), of an ordinary sensation, produced by the influence of some stimulus upon the nerves of general sensibility, as in the case of the twitching of the legs of a paraplegic patient before referred to; or (2), of a special sensation transmitted by the nerves of special sense, as in the contraction of the pupil induced by a bright light, or (in the case of the sympathetic, which to some extent may be looked upon as a nerve of special sense) as in the vomiting produced by irritation of the coats of the stomach; or (3) of an emotional sensation, as in the sudden start caused by a fright; or, lastly, it may consist of an idea, as in the vomiting induced by the idea of undulation and instability in a person who is sea-sick, and in whom the same effect may be sometimes produced by the remembered idea, even when on shore and at a distance from the sea.

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* I put aside the idea of the possession by the spinal cord of a peculiar consciousness of its own, which has been raised, but which has found very few supporters.

† Dr. Carpenter's arguments in favour of this idea, and also of the supposition that there is but one seat both of intellectual and corporeal consciousness, seem to me sufficiently strong to warrant our receiving them as established theories. See On the Functions of the Cerebrum, in his 'Human Physiology.'

The power of the will is exercised in a different degree over the automatic movements excited by these various kinds of sensory impulses. In health, greater command is exhibited by the will over the ideas than over the emotions, and these in their turn can be more easily controlled than the impulses derived from the special senses, and still more so than those derived from the sympathetic or the nerves of general sense. For instance, it is much less easy to restrain the impulsive activity excited by an emotional feeling than it is to curb that which is developed as the result of mere intellectual considerations. The difficulty which is experienced in refraining from vomiting on inhaling a putrid odour is perhaps still greater. It is only under peculiar circumstances that the will can modify or resist impulses to motion derived from the sympathetic system, as is seen in the slight control we possess over the movements of the heart and alimentary canal, whilst scarcely any one can keep his legs perfectly still when the soles of his feet are gently titillated. When the power of the will is enfeebled from any cause, not only do movements which were previously entirely subordinated to its influence exhibit their natural automatic character, but the susceptibility of the system at large to the excitement of reflex action, or what may be called its general reflex irritability, is at the same time proportionately increased, causes which in a healthily balanced state of the nervous powers would produce no disturbance in the regular discharge of their functions now coming into full play as disturbing elements. These rudimentary principles of physiological psychology, which I should have considered it unnecessary to recapitulate had they not been overlooked by most writers on chorea,* will enable us to perceive in what its nature consists. To facilitate their application, I will briefly enumerate the features which the disease presents.

The patient, in most cases a child or young person, is found to labour under muscular movements which are irregular in intensity, and more or less continuous. The attack can often be traced to a violent emotion—such as fright; or it has been preceded by anxiety, or some depressing mental influence. At other times it has commenced gradually, and its origin has been contemporaneous either with the appearance of some source of peripheral nervous irritation—such as worms, or dentition; or with some general disturbance of the system—such as the establishment of puberty, the temporary cessation of the menses, pregnancy, or an attack of rheumatism. The extent of the irregularity of movement varies in different cases; sometimes it is confined to one or both arms, or to one side of the body, the other being entirely free; or it may also invade the legs; whilst occasionally the trunk and all the limbs are involved in a succession of the most violent contortions. In the early stages of the disease, the mental functions, so far as the power of perception, memory, and judgment are concerned, are not obviously affected; but there is in all severe or chronic cases a taciturnity, which sometimes extends to almost complete inability to articulate; and some authors assert that long-existing chorea ultimately enfeebles the mental powers.[*] Not unfrequently, especially where the disease is of some standing, the moral faculties become affected, and the patient exhibits an irritability and mischievousness of disposition which is foreign to his or her natural character.

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* Dr. Carpenter, to whose labours psychology owes so much, has in about half a page clearly pointed out the real nature of chorea, but has not entered into details, which would have been foreign to the object of his work. See his 'Human Physiology,' chapter on the Nervous System. Recapitulation.

Such is a very brief outline of the principal features which chorea exhibits; let us see how far an examination of them will furnish a clue to its pathology. The movements are evidently involuntary; the patient never *wills* them, although in mild cases they may be partially restrained or modified by the will. But a patient labouring under the disease in anything like a severe form may be desired to hold his jerking arm still, and may apparently concentrate his whole mental energies on that object, and he will fail to do so, not from want of the will to succeed, but because his power of volition is not sufficiently strong to overcome the impulses to movement which his arm receives from the nervous centres. The fault does not consist in a perversion[†] of the will, as has been sometimes erroneously represented, but in a diminution or abolition of it. In describing the movements of chorea as the result of perverted volition, many writers have obviously never closely studied them from nature; whilst others appear to have confounded consciousness and volition,[‡] or to have supposed that the want of co-ordinating power, which choreic patients exhibit, is not dependent upon an enfeeblement of the will. That this inability to co-ordinate the actions of allied groups of muscles is really connected with the failure of the will is shown in those curious cases of brain disease where the first symptoms consist in an eccentricity and irregularity of gait, which is evidently dependent upon a deficiency of co-ordinating power, and which the patient, in the early stages of the affection, is able to remedy by concentrating his attention on the act of walking, and so intensifying the volitional impulse. By degrees, however, the will loses all control over the limbs, and complete paralysis, so far as voluntary motion is concerned, supervenes. But, after all, the want of co-ordinating power in chorea is more apparent than real; the eccentric movements of choreic patients being caused, as Hasse has noticed,[§] not so much by a want of co-ordinating power, as by the interpolation of involuntary motor impulses amongst the voluntary ones; to which, unless the will be called very strongly into action, they are superior in energy.[*]

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[*] See Hamilton on 'Purgative Medicines,' Third Edition, p. 117; and Grisolle, 'Pathologie Interne,' Art. Chorée.

[†] A little reflection on the nature of the will will convince any one that a "perversion" of it, in the sense intended by these writers, cannot exist.

[‡] It is a point worth noticing, that whilst the movements of chorea come within the domain of consciousness, the stimuli to those movements, for the most part, do not.

[§] See his article on Chorea, in Virchow's 'Handbuch der Speciellen Pathologie und Therapie.'

The involuntary nature of the movements in chorea explains several features in the disease; one of which is, that even when most violent they are accompanied by little or no sensation of fatigue. In this respect they are no exception to the rule, that the more the will is exerted in the production of any set of movements, the sooner does that peculiar psychical sensation, indicative of nervous exhaustion, to which we give the name of fatigue, occur.[†] The movements of the involuntary muscles rarely give rise to anything like fatigue; and those of the lower animals, who are continually occupied in the ingestion of food, are uninterrupted, from which we should infer that they are unaccompanied by any sensation of fatigue.

Another feature of chorea is, that those movements are least frequently affected which are mostly performed in an automatic manner. Thus, the legs are less frequently attacked than the arms, because the movements of the legs are much more automatic in their nature than those of the arms. The associated movements of swallowing and breathing are rarely affected. The reason of this probably is, that nature has provided against the cessation or irregularity of such movements as these, which are more or less essential to the well-being of the organism, by enduing them with an automatic character; and that the nerves, through which their activity is maintained, becoming habituated to the transmission of regular automatic impulses, present a less favourable means of exit for those unusual and irregular ones which are developed in chorea, than do the nerve-trunks, which supply purely voluntary muscles. That is to say, the nervous impulse, like the electric fluid, passes off by the best conductor, which in this case is the nerve to the voluntary muscle.

Both Seé and Grisolle bear out the assertion of some other writers, which my own experience also corroborates, that chorea generally commences in the left arm, and that the hemiplegic form most frequently occupies the left side.[‡] The explanation of this is not very evident, unless it be referable to the fact that the left arm, and perhaps also the left side, is in most persons subordinate, both as to the frequency and activity of movement, to the right; as a result of which, its nervous organization may be radically weaker, and more liable to the influence of disturbing agencies.

The movements of chorea, then, are of a reflex nature. By what causes are they produced? In chorea, as in most constitutional diseases, we have two ætiological elements to deal with—the predisposing, and the exciting, or, to use a better term, the determining. Several phenomena of the disease help to throw some light upon these, one of which is its physiognomy. No one who has attentively observed cases of well-marked chorea can have failed to notice how closely they agree in their general aspect. They are eminently examples of what is called the nervous temperament. The clear, thin skin; the shy, averted glance; the bright, unsettled eye; the half-inquisitive, half-frightened look; joined with a frequent tendency to laugh or cry, and sometimes with an evident precocity of intellect, are enough to enable any one who has once noted these physiognomical indications of the disease to diagnose it at once, without looking to the limbs for information. So strongly has the physiognomy of chorea impressed itself on my own mind, that I rarely or never fail to recognise a case at first sight by these marks alone; and I should feel little hesitation in picking one out from a number of other patients who had not been, and were not likely to be, afflicted with that disease. Independently of the testimony of the physiognomy to their nervous diathesis, it will be frequently found, on investigation, that choreic patients are very liable to emotional impulses; and it is a well-known fact, that they are often gifted with high reasoning or imaginative powers. Dr. Samuel Johnson was a notorious illustration of this fact.

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[*] The involuntary character of choreic movements is fully recognised by Bright, Grisolle, Romberg, Theophilus Thompson, Prochaska, and other writers of repute.

[†] See Marshall Hall on the 'Diseases and Derangements of the Nervous System,' p. 26. Also Sir B. Brodie's 'Psychological Enquiries,' p. 14, Second Edition.

[‡] "Dans la plupart des cas le trouble de la motilité commence par la moitié gauche du corps; et lorsqu'elle est partielle, elle occupe presque toujours le bras et le jambe du même coté, ou bien seulement le membre supérieur."—Grisolle, op. sup. cit.

Another characteristic feature of the disease is the continuity of the movements, which in severe cases are uninterrupted even by sleep. By continuous, I mean that they do not increase and die off in a periodic manner, like some forms of nervous spasm; but that, with slight variations of intensity, they are constantly at work, one limb taking them up as they remit in another. There is a kind of mild chorea, which is pretty common in polite society, and which is known by the name of "the fidgets," though the subjects of it would probably not much like to be told that they were labouring under a modified form of St. Vitus's dance, and one which only differed from the more severe manifestation of the disease in being more under the control of the will. And it will be generally found, on inquiry from their friends, that patients previously to an attack of chorea have been very fidgetty subjects. These facts, then, seem to show that the nervous system of choreic patients is constantly generating a large amount of nerve force; and that the equilibrium between the tendency of this surplusage of nervous power to escape by means of a motorial or emotional demonstration, on the one hand, and the restraining power of the will, on the other, must be much more delicate than it is in ordinarily healthy persons.* Whether we seek to illustrate this supposed state of things by an electrical metaphor, and speak of it as indicating a highly polar state of the nervous elements; or whether we have recourse to a less scientific simile, and compare it to the delicately-strung wires of an Eolian harp, which vibrate to faint breezes that would strike noiselessly on coarser instruments, it is a condition which it is by no means difficult to conceive. And supposing the same peculiarity of constitution to exist in hysteria, as from the nature of that disease, and from its frequent alliance with chorea, would not be difficult to show, the difference in the manifestations which it exhibits in the two diseases may be not unaptly compared to the difference between the convulsive ebullition of a boiling vessel of alcohol, and the continuous simmering of one filled with water. Or, perhaps, still better, by the difference between the disruptive spark given off from the rounded knob of a charged Leyden jar, and the continuous luminous brush which passes off from the same jar when a point is substituted for the knob.*

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* "The nervous system [of a healthy man] may be compared to an organ with bellows constantly charged, and ready to be let off in any direction, according to the particular keys that are touched. The stimulus of our sensations and feelings, instead of supplying the inward power, merely determines the manner and place of its discharge. The centres of speech and song, for example, when fresh and healthy, may either overflow so as to commence action in a purely spontaneous way, or they may remain undischarged till irritated by some external influence—as, for example, the sound of another voice."—Bain 'On the Senses and Intellect,' p. 291.

Another fact of much importance in estimating the predisposing element in chorea, is that its subjects are in by far the larger number of cases of the female sex and young. The nervous character of the female organism is sufficiently indicated by the emotional susceptibility of the sex, by the acuteness of their perceptions, and by their proneness to demonstrative actions. In the healthy female, the natural excess of nervous energy discharges itself at intervals in the various emotions, in the occupations of maternity, in the peculiarly feminine amusements of singing and dancing, or in some other form of activity. The nervous energy of children, too, keeps them in a state of perpetual movement from morning to night, which it is very prejudicial to repress; and in infants, where nature has not yet acquired the full use of the limbs as an outlet for her surplus nerve force, she relieves herself by those frequent and tumultuous fits of crying which, though they appear to betoken such severe suffering, in nine times out of ten are merely the safety-valve for the surplus energy before mentioned, and as undesirable to restrain as are the violent outbursts of the highly-wrought feelings in riper years.†

We are then, I think, warranted in assuming that the peculiarity of the constitution of choreic patients consists in a tendency to generate a constant excess of nerve force, which in their ordinary state of health, when the will is strong enough to restrain unusual muscular movements, finds a vent in emotional manifestations, in activity of body, or more rarely in intellectual efforts.‡ It is important to remember that such a constitution as this is radically a weak one: it is a state of chronic irritability, and like all irritable conditions, rapidly succumbs to exhaustion. The functions of organs whose irritability is heightened are performed with increased activity, but their energy is soon dissipated. The irritable heart, with its tumultuous throbbings which simulate strength, is essentially a weak one. The man whose heart beats vigorously never feels its action. The irritable stomach is soon worn out. Repose, self-control, is pre-eminently the attribute of real strength. The difference between the two states—to recur to electricity for a metaphor—is just the difference between the charge of a Leyden jar and that of a galvanic battery. The effects of the one are more instantaneous and brilliant than the other, but it is not capable of that prolonged and steady activity which gives the latter its strength. Hence it is why chorea, like delirium tremens (to which it is closely analogous, the one being automatic motion, the other automatic ideation*), in so many cases supervenes upon agencies which have a tendency to exhaust the general power or tone of the nervous system, and to increase its irritability; and hence, too, the efficacy of those medicines and hygienic appliances which act by restoring this loss of tone.

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* Since writing the above, my attention has been called to the fact, that Dr. Todd has compared the paroxysm of epilepsy, which in so many respects resembles that of hysteria, to the disruptive discharge of the Leyden jar, when its charge has reached a certain measure of intensity—a simile, than which nothing could be more happy. See his Lumleian Lectures, in 'Medical Gazette,' May 18, 1849.

† See Bain, op. sup. cit, p. 76.

‡ This idea of a constant discharge of nerve force in the form of a stream passing out from the nervous centres into their trunks is illustrated, though to a much feebler extent, by the phenomenon of muscular tonicity; which, after the experiments of Marshall Hall, must be attributed chiefly to the continuous passage of nervous influence from the spinal cord into the muscles, manifesting itself in the form of a tonic contraction, which is almost, if not entirely, abolished by the destruction of the spinal cord, or the severance of the nerve-trunks leading to the muscles.

It would be interesting, if possible, to ascertain to what extent this peculiarity of constitution which is manifested by choreic patients is dependent upon hereditary influences, and what may be its relation to other diseases arising from a similarly ill-balanced state of the nervous faculties, such as insanity, epilepsy, and hysteria. There are many cases on record which show that the liability to chorea may be directly transmitted from parent to child. Bright instances several such, and Seé states that he has met with 18 cases of hereditary chorea. Dr. Begbie has also drawn attention to the interesting family relation which sometimes exists between chorea and rheumatism.†

Of the connexion between chorea and hysteria there is no want of examples, and of that between it and some other forms of nervous disease a good illustration is cited by Romberg,‡ of a girl aged twenty, suffering under severe chorea, whose grandmother had died insane, whose mother had been subject at every confinement to eclampsia, and at that time suffered from daily attacks of catalepsy, and who had herself had a slight attack of chorea at ten years of age. Here we have in one generation a disease consisting in a withdrawal of the ideational faculties from the control of the will, with no affection of consciousness—i.e., automatic ideation; in the second, a disease manifesting itself in the form of automatic clonic spasm, with loss of consciousness; and in the third, one consisting in automatic muscular discharge, with consciousness unaffected. This case, too, illustrates another feature of chorea, which shows how completely it is dependent upon a radical vice of constitution, and how strongly, when once evoked, it impresses its stamp upon the nervous system, and that is the great liability which it exhibits to recur, even after an apparently complete cure. Bright refers to a case in which there were four separate attacks of chorea in less than three years, followed by others at longer intervals; and every hospital physician must have had choreic patients come to him time after time to get rid of their old enemy.

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* Bouillaud has graphically called chorea "insanity of the muscles!" (*folie musculaire.*)

† Hasse (op. sup. cit.) recognises the probability of the children of "nervous" patients, and of those who have suffered from nervous diseases, being more liable to chorea than others.

‡ Vol. 2, p. 60, Dr. Sieveking's translation for the Sydenham Society.

Amongst predisposing causes, though of a nature secondary to nervous idiosyncrasy, must be classed those which tend to lower the general tone of the nervous system, such as cold, insufficient nourishment, mental exhaustion, and possibly meteorological influences. In reference to cold, I have noticed the greater prevalence of chorea in winter than in summer;* and it is generally stated by writers on the subject that it occurs much more frequently in northern than in tropical climates. The influence of protracted cold in these cases is probably exerted through the heart and circulation, by the retardation of which the blood is prevented from supporting the nutrition of the nervous structures so actively as in warmer weather; the cold, too, being unattended by that healthy reaction which follows the shock of the cold bath, when used for the cure of the disease. Of mental exhaustion, as a predisposing cause, cases are quoted by Romberg and others; and the same author also mentions two cases which appear to prove that certain states of the atmosphere may predispose to an attack of chorea.

Having established the nature of the predisposing causes which induce in choreic patients a proclivity to that disease, it remains to examine the circumstances which determine its immediate supervention. These are all of the class of abnormal or increased sensory stimuli, and may be divided into those which affect the peripheral extremities of the nerves, and those which directly influence the nerve-centres. Of many of them consciousness takes no cognizance; they probably arise in that great visceral system of nerves of which our knowledge is so limited, and may reach no higher than the medulla oblongata. There are those which are dependent upon a disordered condition of the uterine functions; as in the chorea which comes on at the time of the establishment of puberty, or in those cases where the movements are increased during the occurrence of the catamenia; in both of which the concentration of the nervous energies of the sympathetic upon the uterine *nisus* may possibly act as a source of irritation. The chorea connected with amenorrhœa may be explained by the hypothesis that the matters retained in the vascular system by the non-performance of that function of elimination which the catamenial flow undoubtedly supplies, may act as direct irritants upon the nervous centres. In the chorea occurring during pregnancy, we have a more obvious source of nervous irritation; and this form of the disease is quite comparable with the eclampsia which so often supervenes in the latter stages of pregnancy, or during parturition, in patients who have exhibited a previous predisposition to nervous excitability: in both of which cases the presence of the fœtus supplies the irritation requisite to account for the fits, which generally cease soon after delivery is effected.* Indeed, the close relationship which exists between chorea and hysteria, and the occasional violence of the latter, and of puerperal convulsions, show how powerful a source of reflex irritation the uterus may become, notwithstanding the fact that it is an irritation of which the patient is quite unconscious. These three forms of nerve affection also indicate how the same stimulus may produce in one patient disordered cerebration, in another, clonic muscular spasm, and in a third, continuous discharge through the muscles. In connexion with this branch of the subject, two or three recorded cases may be referred to, where nothing was found after death to account for the disease but a deposit of bony or sabulous matter in the fimbriated extremities of the Fallopian tubes.

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* Wicke, as quoted by Hasse, also corroborates this. Of 35 relapses of chorea observed by him, 13 occurred in spring, 12 in winter, 9 in autumn, and only 1 in summer.

Another class of peripheral exciting agencies is found in the alimentary canal, such as the first and second periods of dentition; the presence of worms; and the accumulation of morbid matters in the intestines. The way in which these causes operate is so well recognised in the allied affection, epilepsy, and is so completely analogous to that in which uterine irritation acts, as to need no further comment. Both of these classes of irritants are decidedly peripheral, and probably act through the sympathetic; but there are some cases of chorea where it becomes difficult to decide how far the irritation is centrical or peripheral. For instance, in chorea associated with rheumatism. There can be little doubt that the source of irritation here is a toxæmic one, as originally suggested by Dr. Begbie. That it does not depend upon the cardiac lesion is shown by the occurrence of chorea in patients who have suffered from rheumatism, in whom either valvular disease or pericarditis alone may have been present; by cases where neither of these lesions can be detected, and the patients have not previously suffered from rheumatism, although that disease occurs at a subsequent period; by the occurrence of rheumatism in some members of a family, and chorea in others (Begbie); and by the cure of chorea in patients with persistent valvular disease. Whether the blood-poison in these cases acts as an irritant upon the peripheral nerves in the various organs where it is brought into contact with them; or whether it acts directly upon the nervous centres themselves, must remain a moot point. Cases of chorea which must be placed in the same category, are those which are described by some authors as arising after suppression of long-standing eruptions and discharges; poisoning by lead and mercury; and the previous occurrence of the eruptive fevers.

We now come to those exciting causes of chorea which are of a purely mental nature, where the disease can be traced to a violent impression upon the sensorium, acting in such a manner as to develope in it a fixed tendency to the production of emoto-motor or ideo-motor impulses. Common experience agrees in assigning to fright a very high place in the causation of chorea, a large per-centage of the cases having exhibited the first manifestations of the disease immediately after a sudden and violent emotion of fear. As far as my own observation goes, these cases differ from most others by exhibiting as great an intensity at the commencement as they do at any subsequent period of the disease. Here we have a powerful sensational impulse, such as is capable, even in perfectly healthy persons, of giving rise to temporary reflex movements, impressing itself either in the form of a fixed idea, or a constantly-recurring emotion, upon the cerebrum of patients whose nervous equilibrium is naturally delicate, so as to act for a long time as a centre of continuous irritation. How strong an influence an emotional idea may exert upon the brain, and how long it may continue to act as a stimulus to reflex muscular movement, is shown in cases where a powerful emotion, such as that of disgust at a very fœtid odour, or a loathsome sight; or a powerful idea—such as that which is left in the brain of persons who have been once violently sea-sick—will succeed in evoking involuntarily the desire to vomit long after the original cause has ceased to act. The emotion, or idea—for it is difficult to differentiate the one from the other—becomes fixed, as it were, in the brain, fading away slowly, like a badly-fixed photograph; and as it fades, the reflex movements to which it gave rise also die off, unless—and this it is important to remember—they have existed sufficiently long to acquire the character of a habit. When this occurs, which it does in all chronic cases of chorea, in addition to the difficulty of re-establishing the disturbed equilibrium of the nervous system, we have to contend with that firmly implanted concatenation of nervous actions in which habits consist, and which it is so difficult to break.* The *modus operandi* of fright in these cases is analogous to that of shock in concussion of the brain, lowering the tone of the whole nervous system, lessening the power of the will, and bringing into undue prominence automatic modes of action. Hence we can understand why fright is not only one of the most common, but also one of the most efficient exciting causes of chorea; for at one blow it breaks up the delicate equilibrium of the nervous system, depresses the power of the will, and leaves on the brain an impression which acts so long as it lasts as a constant stimulus to those automatic impulses of which the diminution of the will facilitates the establishment.

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* Romberg, vol. 2, p. 62.

In addition to fright, other determining causes of a precisely similar nature, though inferior in intensity, are more rarely met with, such as "anxiety, dread of impending occurrences, concealed mental impressions, morbid exercise of the imagination, jealousy, envy, &c.,"† all of which involve the presence of a fixed idea or emotion as the source of the involuntary impulse. In connexion with the ideo-motor origin of the movements in chorea, two well-known features of the disease may be noticed—the increased activity of the motions whenever the patients are observed by strangers, and their cessation during sleep. The first of these phenomena may be accounted for in two ways:

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* The important influence which habit exerts in fixing and intensifying the symptoms of chorea, and in modifying the success of treatment, cannot be too strongly insisted on. In no disease is this more marked, except perhaps in epilepsy; in reference to which, Dr. Sieveking has some forcible and practical remarks in his work on 'Epilepsy and Epileptiform Seizures,' p. 171.

† Dr. Theophilus Thompson, in 'Library of Medicine,' Art. Chorea.

either by supposing the increased activity to be due to the patient's attention being directed to the movements from a consciousness of their eccentricity, and so acting as a stimulus to the changes going on in the nervous centres, just as it does in the increased intolerance—i.e., tendency to reflex action, induced by directing the attention to an itching of the skin; or by referring it to the influence of the emotion of embarrassment in exaggerating the emotional impulse already present.[*] The reason why the movements are arrested during sleep is, to some extent, because the attention is entirely withdrawn from them. Their activity during waking hours is greatly exaggerated by the attention being constantly fixed upon them, and when they continue by night as well as by day it is because the vigour of the reflex impulses is sufficiently great of itself to be independent of the intensifying influence of the attention. Dr. Marshall Hall states that in patients who dream much the movements not unfrequently continue during sleep, although the disease may not be of a severe character.[†] In these cases the unconscious cerebration in which dreaming consists serves to maintain the motor impulses, just as in non-choreic patients it may originate them. The more weighty reason, however, for the cessation of the movements during sleep is the great diminution of activity throughout the whole nervous system which takes place at that time, and the concurrent impairment of its sensibility to impressions which in waking hours would produce a marked disturbance in its functions.[‡] Another feature of the disease, which illustrates the possible ideo-motor origin of its movements is its occasional development by imitation (Grisolle, Bright, Watson)—that is to say, from the observation of a patient affected with chorea the idea of movement may become so strongly impressed upon the brain of another person, in whom a natural predisposition to the disease exists, as to lead to the development in him of automatic movements similar to those of the person first affected. This is one of the facts which show the relationship existing between chorea and hysteria, and it also indicates the propriety of separating severe cases of the disease from milder ones, in whom it might become intensified from the mere force of imitation; and also from patients in whom, from their temperament or other reasons, the development of chorea might be anticipated.[§]

In addition to the foregoing well-recognised ætiological elements of chorea, there is another, the possibility of which is worth noticing. It is believed by many psychological writers[‖] that much of the spontaneous muscular activity of the healthy organism, especially in young, "fresh," or over-fed animals, is to be attributed to a stimulus residing in the muscular system itself, which serves to call the superabundant energy of the nervous centres of such animals into action by exciting a demand for its discharge through the nervous trunks by which the muscles are supplied. To this stimulus the term "muscular consciousness" has been applied. It is not improbable, judging from analogy, that this sensation, or stimulus of spontaneous activity, may, under certain circumstances, become morbidly exaggerated, in which case it might lead to the production of chorea. If such an hypothesis be admissible, we shall then have another peripheric source of nervous irritation as a cause of chorea, acting in the same way as, though of a totally different nature from, those before considered. Further, since the state of tonicity of the muscles must greatly influence the extent to which they are affected by stimuli proceeding from the nervous centres, a diminished state of tonicity probably accompanying an increased sensibility to the influence of stimuli, as is seen in some cases of paralysis; and, as this tonicity is to a great degree dependent upon the automatic activity of the spinal cord, it becomes a question how far an abnormal state of sensibility to muscular stimuli, such as is exhibited in chorea, is dependent upon diminished activity of the spinal cord. Supposing this to be the case, we shall have a condition of diminished, or *negative*, activity in the spinal cord, and one of increased, or *positive*, activity in the sensorial centres at its apex, giving rise to a polar state of the cerebro-spinal axis, in which the upper part is + and the lower −.

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[*] Romberg, op. sup. cit., vol. 2, p. 59.

[†] So also does Hasse, loc. sup. cit.

[‡] "This state [sleep] involves the diminution of the mental functions. Sensation, perception, volition, are at their minimum."—Marshall Hall, op. sup. cit., p. 25.

[§] The influence of imitation in the production of chorea is illustrated in the history of those curious epidemic forms of the disease—the morbus saltatorius, or chorea proper, of the Middle Ages. See 'Cyclopædia of Medicine,' p. 205.

[‖] See Bain, op. sup. cit., p. 76, for a discussion of this subject.

The general principles upon which the treatment of chorea should be conducted are so well understood, that it is unnecessary to refer to them at any length; but there are one or two points growing out of the preceding considerations upon which a few remarks may not be out of place.

Before all things, then, it is important not to forget one fact which the experience of all competent observers tends incontrovertibly to prove—viz., that in the large majority of cases chorea will, under favourable circumstances, get well of itself. The success which has attended the numerous and often antagonistic plans of treatment employed in the disease, would of itself be to some extent a *primâ facie* proof of this.* Though it cannot be denied, that occasionally in uncomplicated cases of recent origin the disease may, by judicious treatment, be almost suddenly arrested. But more often the only result which can be accomplished, and the only one which the discreet practitioner will seek by therapeutic means to attain, is by removing the obvious sources of extrinsic irritation, and by stimulating those functions of the economy which seem best calculated to restore to the nervous system its healthy balance, to allow the *vis medicatrix naturæ* to work out her own cure in her own time. It wants no very profound reflection to be convinced that the treatment of chorea should be partly medicinal and partly mental: partly directed to the re-establishment of those functions, as of the uterus, upon whose imperfect performance the exciting element of the disease may depend; and partly to the regulation of those psychical processes in whose perversion its essence consists. When worms are present in the alimentary canal they must be removed. When the uterine functions are at fault they must be rectified. The beneficial effects of moderate purgation, as a general plan of treatment, are admitted by most authors. They are dependent upon the removal of irritating matters from the intestines, the removal of toxæmic matters from the blood, or, in cases of amenorrhœa, the influence which judicious purgation exerts in promoting the catamenial flow. Of the special tonics, iron, arsenic, zinc, and quinine have each their advocates, and the utility of all may be well conceded, though in individual cases one or other may be more especially advantageous—a point which is only to be determined by tentative observation. As a general tonic, the cold shower or douche bath stands in deservedly high estimation, its beneficial influence probably depending in part on the stimulus it gives to all the processes of nutrition through its action on the surface of the body at large, and in part to the healthy shock which it produces, and which breaks the chain of nervous impulses by which the disease is maintained. The great waste of tissue which must follow the constant muscular movements, the generally anæmic and ill-nourished aspect of the subjects of chorea, and the beneficial effects of hospital dietary, independent of strictly medicinal treatment, all point to the necessity of promoting by a full supply of nutritious and easily assimilated food, the various histogenetic processes. It is only to a judicious combination of these several elements of the treatment that the disease yields with rapidity; and nothing but a careful study of the individual peculiarities of each case can determine whether any, and which, should have the priority over the others.

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* See Sir James Bardsley's 'Hospital Facts and Observations,' p. 152.

On the psychological treatment of chorea I wish to lay more stress, not only because I believe it to be equally important with the medicinal, but because it appears to be so generally ignored, not one author in ten bestowing more than a passing word on it. A recurrence to what has been previously said on the nature of the disease will show that the indications which we are called upon to carry out in this branch of the treatment are three—viz., to withdraw the attention of the patient from the abnormal character of his own movements, i.e., to enable him to get rid of his diseased consciousness; to break the incessant chain of nervous impulses which is transmitted through the cerebro-spinal axis, and to remove the dominant idea which appears often to exist in the cerebrum; and to restore the enfeebled power of the will to its healthy control over all the other nervous functions. No plan of treatment is better calculated to fulfil all these conditions than a well-arranged course of gymnastic exercises, or even the use of the dumb-bells and skipping-rope. The dormant power of the will is aroused and brought forcibly and continuously into play. The habitual involuntary movements are replaced by periodic voluntary ones. The attention of the patients is abstracted from the morbid self-contemplation which is always weighing upon them. And the activity of the circulation, and with it that of all the functions of the body, is in every way promoted. In chronic cases, or where the movements are violent, some little difficulty will be experienced at first in getting the patients to undertake active exercise of the kind recommended, and in overcoming the idea which possesses them of their inability to carry it out, but a little perseverance will seldom fail to effect this. Although my own experience is not at present sufficiently large to allow me to speak positively upon this point, I feel but little doubt that by the constant use of a well-devised system of muscular movements, the duration of most cases of chorea may be reduced much below the present accepted average.

It is unnecessary to insist upon the patients being sent as much as possible into the fresh air, or upon the general utility of judicious moral treatment. These are points which must commend themselves to the attention of every thoughtful practitioner.

In conclusion I trust that I may be permitted to express the hope that the time is not far distant when a gymnasium will be considered as essential a part of every well-furnished hospital as a bath-room or a dispensary. No one who has watched the slow progress of convalescence in hospital wards, but must have felt how much it might often have been expedited by the aid which such a department would afford. Time will undoubtedly ere long bring back to us the appreciation of many of those physical appliances in which the medicine of antiquity was so rich. It may, perhaps, require some little courage to replace the time-honoured drugs with their complicated formulæ, and too often obscure modes of action, by the simple and inexpensive applications in which the therapeutics of the ancients consisted. But it is an exchange which will be well rewarded in many cases, and not least in this, if it teaches us that simplicity is not only the aim of all science, but the consummation of the highest art.

Art. III.

A Glance at the Present State of Ethnology, with Reference to the Form of the Skull. Read at the Seventh Meeting of the Scandinavian Association of Naturalists, held at Christiania in 1856. By Anders Retzius, Professor in the Carolinean Institution at Stockholm. Translated by William Daniel Moore, M.B., M.R.I.A., Honorary Member of the Swedish Society of Physicians and of the Norwegian Medical Society.

(*Concluded from our last.*)

D. Africa.

All the people of Africa are dolichocephalic. This circumstance, to which I have already on several occasions called attention, and which, so far as I know, has been disputed by none, is quite peculiar to this part of the world. Europe, Asia, the South Sea, and America exhibit races of people of both forms. Europe, and particularly Asia, have a great preponderance of brachycephalic population. The South Sea islands have, I believe, both forms in nearly equal number, but present a moral preponderance in favour of the brachycephali. Africa wants, so far as is at present known, all trace of brachycephalic population.

The museum of the Carolinean Institution contains a considerable collection of African skulls—from North Africa, of Abyssinians, Copts, Berbers, and Guanches. They have all the same formation of skull—large, wide, oval skulls, very closely resembling those of the Arabians. The Abyssinian skulls—for which we have to thank my countryman, Dr. Behm, of Marseilles—as well as the Coptic, are somewhat prognathic. The Guanchic, of which we have four, whereof two were obtained from Dr. Davis, are all skulls of old individuals who had lost their teeth, and consequently present collapsed alveolar processes, so that the prognathism is but slightly marked.

In all these craniums, as well of Abyssinians as of Egyptians and Guanches, the arch of the skull slopes in an extended curve towards the prominent great occipital tuberosity, which also is somewhat compressed at the sides; the parietal tuberosities are but slightly prominent. This form of skull may be regarded as the prevailing one along the coast and highland region of Northern Africa, as well as in the desert district; and occurs again on the other side of the Atlantic Ocean among the aborigines of the Caribbee islands, as well as in the eastern parts of the continent of America. From South Africa, the museum possesses a considerable number of skulls of various Kaffre tribes, some presented by the Swedish and Norwegian Consul in South Africa, Herr Letterstedt; some by Professor van der Hoeven, of Leyden; some by my brother-in-law, Engineer J. Wahlberg. They bear a strong resemblance to negro skulls; some are rather larger than most negro skulls, but the majority have fearfully prominent jaws and teeth. One of a so-called Bosuto Kaffre, from the interior of the high land within Port Natal, is distinguished for its narrowness, for the total absence of all trace of parietal tuberosities, and for an almost pointed occiput. The Museum possesses an entire skeleton of a Hottentot, presented by Consul Letterstedt; neither from the skull of this skeleton, nor from the good figure given by Blumenbach and Sandifort of the skulls of Hottentots and Bosjesmans, can I find any important deviation from the general form of negroes' skulls. Many ethnologists have considered the Austral negroes to be most closely allied to the Hottentots. Their skulls, however, usually present this difference, that the Austral negroes most frequently, so far as I have examined, have more defined parietal tuberosities than the Hottentots. Nevertheless, these tuberosities are wanting in the skull of the Dyak from Borneo, contained in the Museum.

E. AMERICA.

In an ethnological point of view our investigations must of course be confined to the savage or half-savage tribes, and to those which inhabited this part of the world before its discovery by the Spaniards. The names of these various tribes amount, as is well known, to several hundreds; a great part of them has already disappeared, the residue diminishes every year. The hope of defining and arranging them is likewise in a state of progressive decrease. Extremely arduous and extensive investigations have been brought to bear on the study of these nations, and particularly of their languages. No European philosopher has, since the time of Blumenbach, devoted such fertile labour to the subject of ethnological craniology as Dr. Morton, of Philadelphia, in his 'Crania Americana,' the results of which are nevertheless but little satisfactory. Morton himself, who has brought forward so many facts of high value, has, like the distinguished linguist who with such indefatigable labour studied the American tongues, come mainly to the conclusion, that both the race and the language are one. I am rather perplexed as to this result, for I must confess that, from the facts brought forward by Morton, and the numerous skulls with which he has kindly enriched the collections in Stockholm, I have arrived at a wholly different inference. I can explain this only by supposing that this distinguished man has allowed his extensive philology and great learning to affect his vision as a naturalist. If the form of the skull is to have any weight in the question of the races of man, there is scarcely any part of the world where such contrasts are to be found between dolichocephali and brachycephali as in America, and as such they present themselves to the eye of the naturalist in Morton's 'Crania Americana.' I may just refer, for proof of this, to plate 2, "Peruvian Child from Atacama;" plate 32, Lenni-Lenapé; plate 38, Pawnee; plate 40, Cotonay, Blackfoot; plate 64, Carib of Venezuela; plate 65, Carib of St. Vincent—all of the most marked dolichocephalic forms; and, on the other hand, to plates 30 and 31, Natches, with the great majority of the figures of skulls from Chili, Peru, Mexico, and Oregon, with many others of equally well-marked brachycephalic form. Much as these plates bear the same testimony, I should scarcely have ventured on such a remark, did not a very rich series in our own collections, as well as several valuable drawings by Blumenbach, Sandifort, van der Hoeven, &c., support my opinion.

From what I can infer from the American skulls I have seen, whether in nature or in casts or plates, I have come to the conclusion that the dolichocephalic is the predominant form in the Caribbee islands, and in the eastern regions of the great American continent, from its most northern limit down to Paraguay and Uruguay; and the brachycephalic in the Kurile islands and on the continent, from Behring's Strait, in Russian America, Oregon, Mexico, Ecuador in Peru, Bolivia, Chili, Argentina, Patagonia, and Terra del Fuego.

Blumenbach has given drawings of two Caribbee skulls from St. Vincent, so has Morton, as I have above stated; our collections contain a cast of a Caribbee skull, the original of which belonged to Gall (I am not quite sure whether this is not the same skull which Morton has represented in plate 65 from the Paris museum); all these are dolichocephalic. I have likewise, in foreign museums, seen several skulls from the West India islands, and found the majority of them to be dolichocephalic. Professor Rasch showed me some years ago a skull from Newfoundland, stated to be the skull of a so-called Red Indian; it also was dolichocephalic. No doubt seems to exist that the Caribs were the predominant inhabitants of the Lesser Antilles, and that the same race formerly belonged to the continent, the present Venezuela and Guiana. Morton says of the Caribs:

> "The part of the American race called Caribs, constituted at one time a numerous and widely-diffused people. Their habitat was the northern regions of South America, almost from the river Amazon to the part of the ocean bounding the great valley of the Orinoco, with a large portion of the adjoining countries of Guiana and Venezuela. Hence they extended their emigration to all the Antilles, from Trinidad to Santa Cruz (among the Caribbee islands were included Trinidad, Grenada, St. Vincent, Dominica, Guadeloupe, Martinique, Santa Cruz, St. Thomas, Nevis, Montserrat, Antigua, St. Kitts, and the Virgin isles)." (*loc. cit.* p. 236).

He has given an excellent drawing and description of the skull of a "Carib of Venezuela," plate lxiv., from Dr. Joseph Maria Vargas, of Caraccas. A more characteristic dolichocephalic skull could scarcely be found. Two other Indian skulls, also from Venezuela, are represented and described by Professor van der Hoeven*—namely, from the shores of the small Rio de la Hacha. Of these skulls Van der Hoeven says:—"The tribe to which they belong is that of Goahiros, Guaïras, Guajiros, or Guaigniros, under which names I find it mentioned in the works at my command." These skulls agree with that above named by Morton. Van der Hoeven's opinion is: "the skull of the Guajiros belongs undoubtedly to the dolichocephalic form." All information from Guyana confirms the view that these Indians belong to the same tribe as those of Venezuela—that is to say, are of the great and formerly powerful Caribbean tribe. With respect to the majority of the widely-diffused Indians of Brazil, as well as of Paraguay, the opinion is generally entertained that they belong to the great Tupi or Guarani stock (it is called in Brazil by the Portuguese Tupi, in the south, by the Spaniards, Guarani). Prichard says in one place:—"The great Tupi or Guarani stock is spread over the entire of the eastern coast of South America, from the mouth of the river Plata, or from the mouth of the Uruguay, which falls into it, to the mouth of the river Amazon." Probably it extends, as Azara supposed, to Guyana. Most writers assume that the greatest part of the aborigines of Brazil consists of tribes allied to the Guaranis. More to the south, however, we recognise this stock still more clearly. Thus we can in this direction follow them to the sixteenth degree of southern latitude, and even as far as Monte Video and the river Plata. Throughout this extent the race was scattered in many different points. It occupied near Buenos Ayres a part of Ysidio, and the islands in the Parana. In Upper Paraguay it had extended itself over almost the entire of the central part of the continent; in the province of Chiquitos; in Dhaco it had extended to the eastern foot of the Andes, and in the valleys of that great mountain chain. It occupied extensive districts in these regions, before the reign of the renowned conqueror, Inca Llogue Yupanqui.† Elsewhere Guaranis are mentioned in Corrientes, Bolivia, New Grenada, and many places. In my paper on the Guaranic skulls in the Royal Academy of Science,[*] I have endeavoured to show that the Aymaras in Peru are likewise of the Guarani stock. We have, in the Museum of the Carolinean Institute, two complete mummies of Aymaras. Their skulls exactly resemble the Guarani skulls; probably Morton's "Ancient Peruvians," and the so-called Huanchas (Tschudi), are likewise of the Guarani stock, although their skulls have unmistakeably been made so hideously long by pressure. It is well known that one Brazilian Guarani stock bears the name Aymores.

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* Tijdschrift voor de Wis- en Natuurkundige Wetenschapen uitgegeven door de Eerste Klasse van het Kon. Ned. Institut, Deel v. p. 36.

† Naturgesch. des Menschengeschlechts, von J. C. Prichard, herausgegeben von Dr. Rudolph Wagner und Dr. Fr. Will, Band iv. p. 519.

We have in the Museum of the Carolinean Institute, six Guarani skulls from Dr. Abbot, in Bahia, one from Dr. Langgaard, at Rio Janeiro, one from Consul Billberg in Buenos Ayres, one from Bolivia, from Herr Liljedahl, and three Aymaras from Peru, presented by Herr Chaumette de Fossées, at Lima. These have also been particularly described by me.[†] All these skulls and the others of the Guarani and Carib stocks are dolichocephalic, with tolerably wide heads and rather large jaws. If we now go farther towards the north, we meet in the United States and Canada, on the Atlantic side, also with the dolichocephalic as the prevailing form; namely, among the many tribes usually classed with the so-called Red Indians, as the Algonkins with the Iroquois.[‡]

Morton has given excellent representations of dolichocephalic North American Indians from Cherokee, Chippeway, Miami, Ottigamie, Lenni-Lenapé, Naamkeag, Potowatomie, Cayuga (particularly well marked), Oneida, Huron, Pawnee, Cotonay (Blackfoot). I have myself received from Dr. Morton, as a present, four dolichocephalic skulls from Missouri (Sac Indian), from Michigan (Ottawa, and Miami), from Rhode island (with the inscription "Narraganset"). From all these specimens, with the addition of that I formerly brought from Christiania, of a so-called Red Indian from Newfoundland, I consider myself to be fully justified in assuming that the dolichocephalic has been the prevailing form of skull on the Atlantic side of North America.

In connexion with this, it should be mentioned that the Esquimaux, who likewise border on the same side, also belong to the dolichocephalic tribes; although, among these, they may seem to occupy a very peculiar place. Many writers consider the Esquimaux to be allied to the Tschudi, as well as to the Mongols. Morton himself refers them, in his general ethnographic part,[§] to one and the same family with the Lapps and Sameeids, under the name of "The Polar Family," of which he says, *loc. cit.*: "This singular race is exclusively seen on the northern skirts of the continents of Europe, Asia, and America." In the Special Division, p. 247, he calls them "Mongol Americans." Nothing can, so far as the form of the skull is assumed to present any evidence on the question of stock relationship, be more incorrect. Even at the meeting of the Scandinavian Association of Naturalists in 1842, in my first essay, "On the Form of Skulls of Northerns," I placed the Greenlanders among the prognathic dolichocephali, and gave a description of two Greenland skulls, presented to me by the Greenland naturalist Vahl. This paper was read in the presence of such competent judges as Eschricht, Van der Hoeven, Ibsen, and Nilsson; and they fully participated in the same view. A further confirmation of this was given by Eschricht at the meeting of the Association in Christiania in 1844, in his communication on the "Signification of the Difference in Form of the Skull and of the whole Head." He said on this point: "The Greenlanders and Esquimaux are among the people the shape of whose head is particularly characteristic, and I venture to illustrate this by some Greenland heads from the Physiological Museum of the University of Copenhagen."* The Greenland skulls then shown by my learned friend had precisely the same form as those which I obtained from Dr. Vahl. I should think that few naturalists are more competent to give evidence on this subject than MM. Eschricht and Ibsen, as both have more abundant opportunity of studying Greenland skulls than most other physiologists of our day. Blumenbach has represented two Esquimaux skulls from Labrador; the one (xxiv.) is, however, given in oblique profile, so that the occiput is only imperfectly seen; but, on the other hand, he says in the text, "occiput protuberum;"† the other (xxv.) is drawn in full profile, and shows the prominent occipital tuberosity. Sandifort, too, has given a figure of a Greenland skull from Vahl, of the same characters as those above mentioned. Morton has also drawings of four Esquimaux skulls, from the most northern parts of America, and from the island of Disco, off the coast of Greenland; all of the characteristic form. In the text, he says that they are always characteristic, and that they are most decidedly distinguished from the skulls of the American Indians, but adds at the same time, singularly enough, that these Esquimaux are the only Americans presenting the Asiatic characters. It is evident that this distinguished man has been guided by his already established views, rather then by the strict investigation of facts. He saw, in the formation of the face of the Esquimaux, something Mongolian, that is, Asiatic; but he overlooked the prominent occiputs, as well as other characters which are not Mongolian. In like manner he, as it were, forgot the beautiful figures given by himself, in his splendid work, of dolichocephalic American Indians; of which, some in particular, as Cotonay (Blackfoot), Cherokee, Chippeway, and, above all, Cayuga (pl. 35), approach the form of the Esquimaux skull, with their large alveolar processes and projecting occiputs. I also am inclined to seek the pedigree of the Esquimaux in Asia. For this, however, I have as yet but slight grounds. Thus I have, in another place, directed attention to the great similarity between the form of the cranium of the Esquimaux and the Tungusian skulls, which perfectly accords with the characters of those of the Esquimaux,‡ viz.: "facie plana, ad arcus zygomaticos latissima, fronte depressa, &c.; occiput mirum in modum eminens ita ut protuberantiæ occipitalis externæ distantia a dentibus incisoribus superioribus 9 poll. Lond. æquaret." Blumenbach has also described and represented a skull Sinensis Daurici, of which he says in the beginning: "cranium est genuini Tungusæ Daurici s. Sinensis tribus Saradulicæ." But it is a pity that the occiput and length are neither mentioned in the description, nor seen in the figure, which is in half profile. I have, however, already mentioned that the Carolinean Institute has a considerable collection of Chinese skulls very closely resembling in form the Tungusian and Greenland skulls. According to this view, therefore, it is only in North America that the tribe to which the Esquimaux belong should be a polar tribe; as, from being sparsely scattered through the islands of the polar sea and in the most northern parts of America, they extend from west to east to Asia, towards China, and there constitute the proper Chinese population, which ought to be accurately distinguished from the Tartar Chinese. In the transition from America to Asia I consider them to be composed of the so-called Aleutians, with whose skulls I certainly am not acquainted, but whose characters are described by many as agreeing most closely with those of the Esquimaux.

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[*] Öfversigt af K. W. Ac. förh. 6 Årg. No. 5.

[†] Ibid., Sept. 1848.

[‡] Latham on the Varieties of the Human Species: Orr's Circle of the Sciences.

[§] Cr. Amer., p. 50.

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* Förh. vid. Skand. Natf. M. i Chr. 1844.

† Dec. Cran. 112, p. 9.

‡ Dec. 112, p. 12.

With respect to the rest of the dolichocephalic aboriginal population in America, I venture on a perhaps still bolder conjecture, as I assume it to be related to the Guanches of the Canary islands, and the Atlantic tribes in Africa, as the Moors, Berbers, Tuaricks, Copts, &c., which are comprised under the Amazirgh and Egyptian Atlantidæ of Latham.*

I have several times, in considering our collection of national skulls, directed my attention to the similarity existing between the skulls of the Guanches and Copts, and those of Guaranis from Brazil, of which, as I have already stated we have a very good collection in Stockholm. That these Guaranis are of a stock allied to the ancient Caribbeans of the Antilles has also been stated in the foregoing. Thus we find similar forms of skulls in the Canary islands, off the coast of Africa, and in the Antilles or Caribbee islands, on the African side. The colour of the skin in the tribes in question is stated to be of a reddish-brown on both sides of the great Atlantic Ocean; something like brown-coloured leather; the hair is alike; in addition to which I would hazard the conjecture that the features and structure of the body also exhibit a similarity.

This circumstance reminds me of the account in Plato's Timæus of the ancient Atlantis, which was said to have lain in the sea off North Africa, and to have disappeared in consequence of a great change in the surface of the earth and ocean. The account is reported to have been heard by Solon from an Egyptian priest, during the time when the Greek philosopher was staying in Egypt for the benefit of the instruction of that country's sages. This account contains much which gives it the character of a pure fiction; but is it not, at least, worthy of some attention that the Egyptian philosopher is here named as the particular witness, when, in the present day, we have learned more and more to esteem Egypt as the primeval home of science and art?* Herr Helleberg, a Swedish surveyor, who has been for many years settled in Ohio, has published a work, called 'A Description of the Indians of the North American Republic,'† in which he maintains the opinion supported from many quarters, that the North American Indians are derived from the tribes of Israel; that "the Indians have decidedly Jewish features;" that Mackenzie has seen the Chippeway Indians use circumcision, &c. Without entering into the many arguments adduced in favour of this view, and without, by any means, wishing to advocate it myself, I consider it to be in favour of the conjecture I have suggested. That, in fact, the so-called Red Indians, with the Caribbean and Guarani tribes, should be allied to the ancient Guanches at the other side of the Atlantic Ocean, and the races in Northern Africa related to them, which so closely resemble the Jews both in features and in the formation of the skull, and constitute the most marked contrasts to the Mongolian type, belonging to the Asiatic side. Morton says of the ancient Egyptians,‡ "These primeval people, since called Egyptians, were the Mizraimites of Scripture, the posterity of Ham, and directly affiliated with the Libyan family of nations. In their physical character, the Egyptians were intermediate between the Indo-European and Semitic races." From the direction geology has latterly taken, and the many proofs it has adduced that some countries have sunk in the depth of the ocean, while others have risen, and still are rising, the opinion seems to involve no impossibility that America was formerly more closely connected both with Africa and Asia. It is said, too, that among the American Indians obscure traditions in reference to this circumstance still exist in many places.

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* The Natural History of Man. London, 1850.

The American brachycephalic tribes belong chiefly to the side of America looking towards Asia, the Pacific Ocean, and the South Sea, and seem to be allied to the Mongolian nations. In favour of this view, already put forward by the most distinguished naturalist of the present day, Alexander von Humboldt, more and more convincing proofs are coming to light; and as some of these American brachycephalic people, during the periods immediately preceding the conquest of America, possessed the highest social culture of that part of the world, it would appear that this has acted so powerfully on the inhabitants of the greatest part of the great continent, that the most eminent ethnologists of our time have believed themselves justified in hence inferring the unity of the American race. It is probably for the same reason that the distinguished Dr. Latham has so judiciously introduced the term "American Mongolidæ" (*loc. cit.*), which denomination, however, he extends further than ethnological craniology can justify. I have already remarked that the never-to-be-forgotten Morton himself brought forward the most abundant craniological arguments in favour of this view, and that he was led to regard the characters of the brachycephalic American nations as the prevailing characters of the American Indians in general. Arguing from the specimens in the collections under my care, I have myself long been convinced of the affinity of the American brachycephalic nations with the brachycephali of Asia and the South Sea. In my address at the meeting of naturalists at Copenhagen, in 1847, I said: "The brachycephalic tribes in America constitute an almost uninterrupted chain through the entire western side of this part of the world to Cape Horn and Terra del Fuego." In the same address I quoted Pöppig's reliable expression about the Cholos of Chili: "They are of an olive colour, and distinguished by the oblique direction of the fissure of the eyelids, a well-marked peculiarity of all Southern Indians."* In my essay too, on the skulls of the Pampas Indians,† I have announced the opinion I have here also expressed, of the division of the dolichocephalic and brachycephalic Indians, and the affinity of the former with the Guanches and the Atlantic nations, as well as of the brachycephali with the Mongolian. In reference to the latter question we have, in Rector Daa's learned work upon the affinity of language of the people under consideration, obtained many striking proofs. But I believe I ought here in particular to mention the further proofs we have obtained through the ethnological investigations recently published with respect to the natives of the southern parts of the territory of Russian America, which is situated so much to the north. I would especially refer to an excellent work by Herr H. J. Holmberg, which has lately appeared, entitled 'Ethnographische Skizzen über die Völker des Russischen Amerika,' 1ste Abth., reprinted from the 'Transactions of the Finnish Scientific Society,' Helsingfors, 1855. Herr Holmberg, who spent a long time in that distant land, and made himself master of the rich Russian literature respecting it and its people, divides it among four principal tribes—namely, the Thlinkites, who, from the Russian name, Koljusch, are by most ethnologists denominated Koluches; the Konægi, the Thuaina, and Aleutians, each of which is further subdivided into a considerable number of smaller tribes. In the part already published, the first two, or the Koluches and Konægi, are treated of. With respect to the Koluches, the author says he is inclined, with Wrangel, to regard them as allied to the Aztecs, although their language is still so little known. The author does not describe the form of their skull.

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* See Lectures on the History of Medicine, by J. V. Broberg, l. d. Stockholm, 1846.

† Beskrifning, &c. Götheberg, 1848.

‡ Crania Egyptiaca, p. 65.

Of the Konægi, called by the Russians Kadiaks or Kadiakan Aleutians, the author mentions the following about the form of the skull: The external appearance of the Konægi presents some characteristic marks, which distinguish them from the other tribes on the western coast of North America. Among these characteristics the principal is the shape of the skull, the occiput being not convex but flattened.

These statements already gave reason to infer that both these tribes were brachycephalic, and therefore not Esquimaux. This I have since had an opportunity of confirming through information derived from the highly esteemed founder of the Anatomical Museum at Helsingfors, Professor Evert Bonsdorff. By his kindness I have in fact been enabled to examine skulls of both the tribes in question.

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* Reise in Chili, p. 201; Förhandl. ved de Skand. Naturf. femte Möde, Kjöbenhavn, 1849, pp. 193–4.

Ofvers. af K. Wet. Akad. förh. 1855, No. 1, pp. 5 and 6.

The Thlinkite or Koluchian skull is longer than that of the Konægi. The occiput is rather flat than convex, but not so flat as in the Konægi; it is very broad. The plane of the vertex is broad and flat, except along the sagittal suture, where it is elevated. The parietal tuberosities project almost angularly, the sides slope transversely, the temples are prominent; the curved temporal lines pass up to the plane of the vertex; the width between the temples, as well as between the mastoid regions, is very considerable; the whole breadth of the skull is, as in the Buratians, very striking. The base of the skull is, as it were, pressed in upwards towards the cerebral cavity, so that the articular tuberosities of the occipital bone are as if depressed into the condyloid fossæ; the basilar portion of the bone is flat and horizontal. The breadth over the zygomatic arches is considerable, as is that of the alveolar arch; the whole structure of the bone is very strong, and the weight of the skull is unusually great. Viewed in profile, this skull would readily be referred to the dolichocephalic form; but when seen from below, or looking at its periphery, it evidently exhibits the Mongolian or brachycephalic type. The shape of the face has, however, some resemblance to that of the Esquimaux, so that the whole constitutes a transition between this form of skull and that of the Konægi, which is more like the Azteca. Both Blumenbach* and Sandifort† have represented and described Thlinkite skulls, under the name of "Cr. Schigitana," of the same form as that here spoken of; both Blumenbach's and Sandifort's were brought home by Krusenstern's expedition from Norfolk Sound. The skull of the Konægi is chiefly distinguished by its shortness, its flat, broad occiput sloping obliquely backward; its high curved temporal lines; its short quadrangular, vertical plane; its broad zygomatic arches; its narrow, sharp nasal ridge, with a small pear-shaped nasal opening. The teeth in this skull have fallen out, and the alveoli are collapsed, so that it is impossible to judge how the alveolar arch was circumstanced while the teeth still remained. In this skull, too, the vertical plane is elevated along the sagittal suture. This skull resembles that of the Aztecs in its shortness and the flatness of its occiput.

Through the special kindness of Henry Christy, Esq., our museum has obtained three such skulls, dug up out of an Aztec burying-place in Mexico. This burial-place was met with in making ramparts and moats for the fortification of the city of Mexico in the war with the United States. In these excavations was found, besides the skulls, a number of Aztec vessels, implements, and images, a great part of which was preserved by Mr. Young, of Mexico. The skulls which I received from Mr. Christy were four in number; one of them was transferred, in concert with him, to the Ethnological Society of

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* Loc. cit., pl. LV.

† Loc. cit. f. III.

London, through its Secretary, Mr. Cull. All these four skulls were exhibited to the Ethnological Section of the British Association in Glasgow, in 1855, and are mentioned in the Transactions of the meeting.* They closely resemble the brachycephalic Peruvian skulls represented by Morton, as well as those I described under the name of Inca Peruvians.†

They are all less than the skull of the Konægi, are not so broad, and have not such prominent temples. They are also distinguished by their shortness, by a broad, flat occiput sloping obliquely backwards, high temporal ridges; a short four-sided vertical plane, with a slight elevation or ridge along the sagittal suture; the base of the skull is very short, the face is slightly prognathic, as in the Calmuck Mongols; the alveolar arches are wide; the nasal openings are rather small, but the nasal bones are prominent, as in Europeans. The face, on the whole, is of the flat Mongolian type; the arches of the jaws are tolerably wide.

Between Russian America and Mexico lies the Oregon teritory, the form of the skull of the inhabitants of which is so well known through Morton,‡ who has given such good representations of Chinûks, Klatsoni, Killemooks, Klatsops, Kalapooyah, Clickitat, &c. We have three interesting Oregon-Indian skulls in our museum; two from Dr. Morton, and one from Dr. Meigs of Philadelphia. The former I have described,§ and have shown their brachycephalic Mongolian type, which appears particularly evident, as the skull has not undergone the vertical flattening used among these Indian tribes. There is no doubt that the Araucanians in Chili are brachycephali, and that the form of their skull is allied to that of the Peruvians and Mexicans. The Araucanians described by Morton are distinctly brachycephalic, with wide alveolar arches. Of this I obtained some years ago a particular confirmation, when my former colleague and prosector, Herr Ehrenfried Ekströmer, who (as surgeon) accompanied the frigate *Eugenie* on her voyage round the world, visited Chili. Herr Ekströmer had a special commission to observe the form of the skull of the Araucanians, and also reported that they are decidedly brachycephali. From Chili the brachycephalic tribes have extended into the Pampas in the republic of Buenos Ayres, as well as over the entire of Patagonia, and to Terra del Fuego. Of Indian skulls from the Pampas our museum has been presented with three particularly good specimens by Swedes settled in South America; one from Herr Wilhelm Smitt, formerly proprietor of extensive estates in Eastern Banda; one from Dr. Michaëlson, Professor of Midwifery in Monte Video; and one from Dr. Ernst Åberg, practising physician in Buenos Ayres. Besides, we have a plaster cast of a girl, aged thirteen, of the Puelché tribe. This girl was among the Indian children taken prisoners in one of the wars of extermination waged against the Indians of the Pampas under

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* On Celtic, Slavic, and Aztec Skulls, by Prof. Retzius: The Report of the British Association, &c., Glasgow, p. 145.

† Öfvers. af K. W. A. förh., No. 7, 1848, p. 140.

‡ Cr. Amer.

§ Öfvers. K. W. A. förh., 1847, No. 1, p. 27.

General Rivera, and was brought as a curiosity to Sweden. I have given a more accurate description of her, which has been inserted in Herr Tarras' essay on the Indian Tribes in the Plata and Oriental Republics, in the 'Kgl. Wet. Akad. n. Handl.,' 1845; and is accompanied with an excellent portrait, both profile and full face, executed by Hr. Wilh. von Wright. During my stay in Paris in 1833 a whole troop of Pampas Indians arrived there, of the so-called Charruas, and our museum possesses a plaster cast of one of the men, an old cazique. Latham has, in his small interesting work, the Varieties of Man, in 'Orr's Circle of the Sciences,' given good profile figures of the busts both of a Charrua and of a Puelché girl. Of the latter he has also introduced a full-face drawing, after von Wright's portrait already mentioned, in his larger book, 'The Varieties of Man.'

Morton, in his frequently-quoted great work, has represented the skull of a Charrua (from Brazil) as well as of a Puelché, both from originals in the museum in the Jardin des Plantes at Paris. He says of the skull of the Puelché:

> "We are at once struck with the broad face, the projecting upper jaw, the arching of the zygoma, the low os frontis, the flattened occiput, and the fulness of development above the opening of the ear. The size of the lower jaw and the perfection of the teeth are also characteristic." (Loc. cit., p. 137.)

I have accurately described and represented the Pampas or Puelché skull, which our museum obtained from Herr Smitt.* It agrees very closely with Morton's description, but the lower jaw and teeth are wanting. These, on the contrary, exist in the skull sent us by Dr. Michaëlson, and are, as Morton said, highly developed; the openings of the ears, too, are large and almost circular.

I have not seen any skulls of Indians from Terra del Fuego, but have examined the excellent profile portraits in Captain Fitzroy's 'Narrative of the Surveying Voyage, &c.,' 1839. From these portraits we see that the Indians of Terra del Fuego, the Fuegians, are almost in a still higher degree than the Pampeans brachycephalic.

From this sketch it will be seen that we have everywhere found it fully confirmed that the brachycephalic and prognathic form of the head prevails from the shores of Russian America to Cape Horn and Terra del Fuego—a view which we also find well expressed after his manner by Morton himself, in a posthumous work, where he says:

> "Every one who has studied this subject with attention knows that the Peruvian skull has a round shape, with a flattened, almost perpendicular occiput. It is at the same time marked by an elevated vertex, great interparietal width, dense structure of bone, prominent nose, and broad prognathic maxillary region. This is, in a greater or less degree, the type of the form of the skull in all the tribes from Cape Horn to Canada."†

As is well known, Morton repudiated the idea that these Indian tribes were allied to the Mongolians—a condition which he attributed only to the Esquimaux. In like manner he assumed as a decided matter, that with the exception of the Esquimaux, all Americans were of one race. In one of his latest essays he expresses himself thus:

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* Ofver. af K. W. A. förh., No. 1, 1855.

† Morton's Inedited MSS., &c., in the Types of Mankind, &c., by J. C. Nott and George R. Gliddon. London and Philadelphia, 1854, p. 325.

> "I can assert that after sixteen years' almost daily comparisons, I have found only confirmation of the conclusions which I put forward in my 'Crania Americana,' that all the American tribes, with the exception of the Esquimaux, are of one race, and that this race is peculiar and different from all others. The first of these propositions may be regarded as an axiom in ethnography; with respect to the second, various opinions still exist, and of these the most generally received is that which refers the American race to the Mongolian."*

I have, however, in the foregoing, followed chiefly those tribes which I prefer with Latham to call "American Mongolidæ," along the coast. But they have also extended far inland in an eastern direction. Thus, according to Morton's great work ('Crania Americana'), we find them on the banks of the lower Mississippi as Natchez; in Louisiana as Chetimachas; in Georgia, Alabama, and Florida as Muscogées or Creeks; in Florida as Uchés and Seminoles; in Wisconsin as Menominées and Ottogami; in Arkansas as Osages. Morton has moreover described and represented skulls of the same shape from old graves in Virginia, Ohio, and Tennessee. In the museum of the Carolinean Institute we have two such Mongol-shaped skulls from the United States, presented by Morton—namely, of a Sae-Indian from Missouri, and a Menomine from Michigan. I have already spoken of the penetration in a westerly direction of Dolichocephalic tribes into Peru, but the proper principal habitats or head quarters of the tribes have since the discovery of the country by the Europeans, continued in great part unchanged even to our own time.

Before closing this sketch on the influence exercised on the development of ethnology by the study of the form of the skull in different nations, it ought not to be out of place to advert to the question of the artificial shaping of the cranium. This Pagan custom formerly mentioned or described by many Oriental, Greek, and Roman writers, had long been wholly forgotten in the civilized world, until the same was discovered to exist as a wonder-exciting peculiarity among several of the American Indian tribes. Blumenbach, who happened to take up this question in describing a Carib skull from St. Vincent, mentions that Sabatier, Camper, and Arthaud deny the possibility of such an artificial moulding of the skull, but he himself fully refutes this opinion.† In his description of the skull of a Turk,‡ he brings forward a long quotation from Vesalius,§ which is well worth reproducing here:

> "Plerasque nationes peculiare quid in capitis forma sibi vindicare constat. Genuensium namque, et magis adhuc Græcorum et *Turcarum capita globi fere imaginem* exprimunt, ad hanc quoque (quam illorum non pauci elegantem, et capitis quibus varie utuntur tegumentis accomodatum censent) obstetricibus nonnunquam magna matrum solicitudine ferentibus."

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* Some Observations on the Ethnography and Archæology of the American Aborigines Extracted from the American Journal of Science, vol. xi. § 2, p. 9. New Haven, 1846.

† Dec. prima, p. 27. ‡ Loc. cit., p. 16. § De corp. hum. fabr., p. 23. Ed. 1555.

For long after this matter attracted but little attention, until Pentland brought home the remarkable skulls from Peru which have been described by Tiedemann,* cast in plaster, and distributed to so many public and private museums. Many other artificially-moulded skulls subsequently arrived from the same part of the world, of several different forms, until we obtained a complete history of this custom, and of the manner in which the transformation is accomplished among many Indian tribes, in Morton's 'Crania Americana.' The numerous and authentic accounts we thus received from America caused this absurd and heathenish custom of artificially moulding the skull to be almost universally regarded as belonging to the aboriginal Americans. Still opinions long continued to be divided as to the artificial shaping of the head. Thus, even the distinguished anatomist Tiedemann declared (loc. cit.) that its strange shape did not depend on art, but was a natural formation. The Swiss naturalist and traveller, Tschudi, was of the same opinion.

In the year 1844 (1854 ?) I described an Avar skull, a plaster cast of which had been kindly sent me by Professor Joseph Hyrtl. This skull was artificially shaped, with a posteriorly placed, very elongated vertical region, but in other respects exhibited all the characters of having belonged to a Turanic, that is a brachycephalic individual. This confirmed the suspicion already excited, that it belonged to an Avar, because the Avars are a branch of the Ural-Turkish stock. Tschudi had, as is well known, previously declared that this skull had belonged to a Peruvian. In the following year, a remarkable essay by Rathke appeared,† whence it was found that exactly similar skulls were dug up at Kertsch, in the Crimea. Rathke referred to Hippocrates' book, *de aëre, aquis et locis*, L. iv., and to Strabo, giving an account of the custom observed by the macrocephalic Scythians of artificially shaping the skull by bandages and pressure. Many such skulls, from the district of Kertsch, have since been described by Dr. Carl Meyer.‡

In 1854, Dr. Fitzinger, of Vienna, published a very valuable and learned treatise on the skulls of the Avars, &c., in the 'Denkschriften der kaiserl. Akademie der Wiss,' V. 1, Wien, 1854, in which he shows that the transformation of the skull in many districts of the ancient Eastern Roman Empire is mentioned by old writers, while he describes a more recent compressed skull found in Lower Austria. In 1852, I obtained from Herr Troyon, in Switzerland, drawings and a description of two such ancient compressed skulls from Switzerland and Savoy, in reference to which I gave a communication in the 'Transactions of the Royal Academy of Science for 1854.' From important notices by the learned French Academician, Amedée Thierry (Attila, &c.), I had ascertained that the custom of artificially shaping the skull was anciently derived from the Mongols, and that the Huns learned it from them; also that this operation was performed to give the individual an aristocratic appearance, as Hippocrates stated of the macrocephalic Scythians, and as is still the case among the Oregon Indians.

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* Zeitschrift für Physiologie, Band v. Heft 1, p. 107.

† Müller's Archiv, p. 148. 1855.

‡ Ibid.

But at the same time I have had an opportunity of observing that this custom is still to be found in France, probably remaining from the remote times when the Huns were masters of the country. The maintenance of this custom in certain districts of France is in fact mentioned, and the custom described in Dr. Foville's work on the anatomy of the brain,[*] without the author seeming to be aware of its historic foundation and meaning. The matter is mentioned in his work as a pernicious habit, contributing to disturbance of the mental functions. Shortly afterwards I received from Professor Geoffroy, of Marseilles, a confirmation of the fact that this custom still exists in the south of France, not far from Marseilles. It is said also to be met with in several places in Turkey, as is above mentioned from Vesalius, &c.

As it has been thus fully shown that the custom under consideration of artificially transforming the skull has belonged from the remotest period to some of the eastern nations, and that it is stated by Thierry to be properly of Mongolian origin, I opened in the same paper the question whether this circumstance was not in favour of ancient relations between the old world and the new. This seems now to be placed beyond doubt by the numerous arguments brought forward from time to time by so many and such able investigators. Probably the custom was imported with the Mongolians into America, and that from them it spread also to the non-Mongolian population on the American Continent. It seems evident that the pressure is among the majority of tribes made upon the occiput, to render this part flat and short. This mode of pressure has been the most usual among the American Mongolians or the brachycephalic Indians. The pressure from above (among the Flatheads) has probably proceeded from the proximity of the Oregon Indians to the Esquimaux, who have large and broad heads. The pressure from before (Huanchas, Caribs) seems to have been for the purpose of making the head still more dolichocephalic, and therefore belongs to the dolichocephali, for whom I venture, after the example of the distinguished Latham, to propose the denomination of American Semitics.[†]

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[*] Traité complet de l'Anatomie, de la Physiologie, et de la Pathologie du Système Nerveux Cérébro-spinal, p. 632; Atlas, pl. 23, fig. 1, 2. Paris, 1844.

[†] Soon after the appearance of the first part of the above translation in the April number of this Review, I learned with much regret that Sweden had lost one of her brightest ornaments, and myself a warm friend, in the removal by death of the distinguished author of the original. Professor Retzius died, as the readers of this Journal are doubtless aware, at Stockholm, on the 18th of April, in the sixty-fourth year of his age. He had attached considerable importance to the appearance in English of this paper; but as I have since learned from my friend, Baron Gustaf von Düben, the April number of the Review did not reach Sweden until after the Professor's decease. In the last letter which it was my privilege to receive from Professor Retzius, he says, referring to some translations I had sent him: "It is a great advantage for an author, in a language so little known as ours, to see his papers translated in the first and most spread languages in the world in so correct a manner. You give me also hope," he adds, "to once see my ethnological views in English; I should be very thankful for that, as you see that it contains some views of, as I think, great importance; as in the question on the unity of the American races, which I have clearly shown false; in the question of the originality of the Chinese, and their total separation from the Mongols; in the Turanic origin of the Swiss and South Germans, &c. I expect hard combats when this paper once will be known." But I am induced to make a further quotation from the same letter to show that

while the lamented Professor had no objection to initiate the peaceful combats of science, he was truly anxious for the peace of the world; as well as to exhibit the kindly feeling and respect which he, in common I am sure with the vast majority of his fellow-countrymen, entertained towards this country: "I cannot say," he continues, "how much we are glad to see the good political relations with France returning, and that your noble support of Italy is gaining ground. It seems now that the naval preparations of France have been made more with intention to support the Suez Canal question, and the acquisition of the new harbour in the Red Sea. We have here the opinion that the French Government have the intention from long time ago to recover its old power in Madagascar. We have never believed it possible that France would attack England itself. Now, as we see that you are preparing a great Exhibition 1862, we may have full guarantee for the world's peace." There is one other trait in this great man's character to which I would briefly refer, I mean his undying love of science. I have seen it stated in the 'Athenæum,' although it does not appear on what authority the statement is made, that "on his dying bed Professor Retzius made observations on the progressing dissolution of his own body. 'This struggle of death is hard,' he said to those about him, but it is of the highest interest to note the wrestle between life and death: now the legs are dead; now the muscles of the bowels cease their functions; the last struggle must be heavy, but for all that it is highly interesting.' These were his last words." May it be that the Christian's hope was the true source of this "victory over the grave!"—W. D. M.

PART FOURTH.

Chronicle of Medical Science.

HALF-YEARLY REPORT ON PHYSIOLOGY.

By Hermann Weber, M.D.
Fellow of the Royal College of Physicians, Physician to the German Hospital.

I. Food and Digestion.

1. Hoppe, F.: *Researches on the Constituents of the Milk.* (Virchow's Archiv, vol. xvii. p. 417, 1859.)
2. Körner: *On the Changes of Cane Sugar in the Alimentary Canal.* (Dissert. inaugur. Vratisl., 1859; and Schmidt's Jahrb., vol. cv. p. 156, 1860.)
3. Davy, J.: *Some Miscellaneous Observations . . . . on the Stomach of Fishes in relation to Digestion.* (Proceedings of the Royal Society of Edinburgh. New Ser., vol. xi. p. 252, 1860.)
4. Nasse, H.: *Contribution to the Physiology of Bile.* (Archiv f. wissenschaft. Heilkunde, vol. iv. p. 445, 1859.)
5. Corvisart: *Remarks on a Critique of Dr. Brinton's on my Memoir on a little known Function of the Pancreas.* (Dublin Quarterly Journal, No. lvii. p. 66, 1860.)
6. Screbitzki: *On the Influence of the Pancreatic Juice on Fats and Albuminates.* (Dissert. inaugur., Dorpat, 1859; and Schmidt's Jahrb., vol. cv. p. 153, 1860.)

Hoppe proved the existence of *albumen* in the milk, which had appeared doubtful to some chemists, by causing the milk to pass through an animal membrane. The transuded fluid thus obtained, contained, besides sugar of milk, salts, extractive matters, and casein, an appreciable amount of albumen, recognised by the characteristic coagulation at a temperature of 70° to 75° Cent. (158° to 167° F.). In the paragraph on the *sugar of milk* and its decompositions, the author remarks on the fact, that milk, heated to about 266° F., coagulates, and assumes at the same time a brownish colour. Experiments made with pure sugar of milk dissolved in water show that this brownish colour is due to a decomposition of the sugar of milk; that already the temperature of 220° to 230° F., continued for some time, is sufficient to produce the brown colour in the fluid; that in the process of this decomposition of the milk-sugar, oxygen is absorbed from the atmospheric air; and further, that while oxygen is absorbed, a volume of carbonic acid is given off, which is smaller than that of oxygen absorbed. This deoxidizing action of the milk-sugar established under the influence of heat even in pure water, renders its action on oxide of copper, oxide of bismuth, and other metallic oxides, easily conceivable. Hoppe, at this place, points out the analogous bearing of sugar, glycerides, albuminous substances, and fat, under the influence of water and an elevated temperature. The various sugars appear to be the most ready substances to undergo decomposition, then follow the gelatine forming substances, the albuminous bodies, and at last the different kinds of fat, which, only under the continued action of a very high temperature, slowly undergo decomposition. The lactic-acid fermentation of the milk-sugar is caused by a ferment which is ready formed in the milk, and which is destroyed by a temperature of 212° F., but reproduced again under the influence of atmospheric air. The fermentation once commenced in the milk, does not require for its further progress the continued influence of oxygen. Under the head of *extractive matters* of the milk, the author enters on the question of the reaction of the milk, which, even in a perfectly fresh condition, is often acid. Berzelius, who considered this acid reaction as the usual, attributed it to lactic acid; but Lehmann, in the last edition of his Physiological Chemistry, denies the presence of lactic acid in fresh milk, and thinks it caused by acid phosphate of soda. Hoppe, however, could not discover in such milk any acid phosphates of soda, but a non-azotized acid, similar in its reactions to lactic acid. The author corroborates Berzelius's statement that the alcoholic extract of milk is similar to that obtained from meat. The quantity of this extractive matter is much increased when the milk had been standing. The amount of *gases* in the milk is very small, about three per cent. (volume); they consist of nitrogen and carbonic acid, oxygen being either altogether wanting, or if present, only in an exceedingly small proportion.

While examining the manner in which the albuminous substances of the milk are influenced by the atmospheric air, the author arrives at the inference, that in the milk, through the action of the oxygen of the atmospheric air, some fat is formed, carbonic acid being at the same time evolved. Hoppe appears to entertain no doubt that this formation of fat is caused by the decomposition of casein. For the facts on which these inferences are based, we must refer to the essay itself.

Köbner performed his experiments on the changes of cane sugar in the alimentary canal with the assistance of F. Hoppe. The authors found that cane sugar digested with filtered gastric juice at a temperature of 104° F., remained unchanged even after the lapse of four days. The addition of soda or ammonia had not led to the transformation of any portion of the cane sugar into grape sugar after a digestion of from three to forty-six hours, but the quantity of the cane sugar had become slightly diminished. In the stomach of dogs, too, that had been fed on cane sugar and meat, no other kind of sugar but cane sugar could be found within the first eight hours after the meal, and after a period of between seven and eight hours from the meal every trace of sugar had disappeared. The constituents of the bile evidently exercise an influence on transformation of cane sugar. Neutral bile, deprived of mucus, mixed with a solution of cane sugar, offered, after from two to four days' digestion in a temperature of 62·6° F. and of 104° F., an acid reaction and a considerable amount of grape sugar; the acid reaction being not caused by lactic acid, but probably by the acids of the bile. Bile, not deprived of mucus, produced in a similar solution of cane sugar likewise an acid reaction, with, however, distinct traces of lactic acid; it caused also the transformation of a portion of the cane sugar into grape-sugar, but the quantity of the latter was less than in the mixture with pure bile. These experiments, as well as the examination of the contents of the small intestines after the ingestion of cane sugar, show that in this part of the alimentary canal transformation, at all events of a part of the cane sugar consumed, takes place. The absorption of sugar is largest in the stomach and duodenum, and part of the cane sugar is evidently absorbed as such, as Köbner has corroborated Bernard's observation regarding the existence of cane sugar in the blood of the portal vein.

Davy having examined the state of stomach and intestines of many fish—especially of several species of the genus salmo—arrives at the following inferences:—"1. That the gastric juice, and probably the other fluids concerned in the function of digestion in fishes, are not secreted till the secreting organs are stimulated by the presence of food—a conclusion in harmony with a pretty general physiological law, and in accordance with what has been best ascertained respecting the gastric juice in other animals." 2. That probably the gastric fluid—a fluid of acid reaction—is less potent in the instance of fishes as a solvent, than the alkaline fluid of the appendices pyloricæ, and that even as regards the gastric fluid, its acidity is not essential to it, as its action does not appear arrested when it is neutralized by the presence of articles of food abounding in carbonate of lime.

Nasse's contribution to the physiology of the bile contains some interesting communications regarding the action of bile on starch. The author found that the bile of the pig, as well in its natural condition as also diluted, has the power of dissolving raw amylum, while the bile of the ox exercises no such influence. He further proved that it is not the mucus contained in pig's bile, but the hyocholate of soda, to which the dissolving action is due. The addition of carbonate of soda as well to the pig's bile as also to that of the ox, caused no alteration in their action; the addition of tartaric acid increased the solving power of the pig's bile, but had no influence on the bile of the ox. The action of the two kinds of bile on boiled starch is likewise very different. The pig's bile, as well in its natural state as also diluted, causes only little change in the boiled starch, leading to the development of a small quantity of acid, and only traces of grape sugar. The bile of the ox, on the contrary, dissolves boiled starch rapidly, forming principally grape sugar and only a small amount of acid.

Nasse attributes the influence of pig's bile on raw amylum to a chemical affinity between the hyocholic acid and a constituent of the amylum, which latter appears to undergo, by the process of boiling, an alteration, and thus to lose the affinity to the hyocholic acid.

The author further performed experiments with tartaric acid, which proved that this acid, too, has the power of dissolving raw amylum, but requires to be used in more concentrated solutions, in order to have the same effect as hyocholic acid. Citric acid and lactic acid do not exercise the same influence as tartaric acid.

Corvisart objects, in his reply to Brinton's paper* on the action of the pancreatic juice, that Brinton's manner of experimenting was different from that recommended by him, and that this difference caused the discrepancy in the results obtained. The points which Corvisart especially mentions as to be avoided are:—1. The use of a pancreatic infusion in which putrefaction has commenced. 2. The crushing of the pancreas, in order to obtain the pancreatic infusion. 3. The use of a pancreatic infusion which passes through the filter turbid and lactescent. 4. The use of a pancreas not taken from the animal at the period of digestion (i.e., five or six hours after a meal). Corvisart adds, that the pancreas "of a carnivorous animal, like the dog, where the periods of digestion are well marked," is preferable. Finally, he earnestly invites further experimental criticism, as the only means to elicit the truth.

Skrebitzki's researches, made under the guidance of Bidder and Schmidt, corroborate the observation of these physiologists, that fat is absorbed already in the stomach, and this in so large a quantity, that it appears impossible to attribute this absorption to the possibility of regurgitation of pancreatic juice into the stomach; that therefore the absorption of fat must be considered as independent of the presence of pancreatic juice. Skrebitzki's experiments regarding the influence of the pancreatic juice on albumen, lead the author to the conclusion that fresh infusions of pancreas do not dissolve more albumen than mere water or alkaline fluids containing the same amount of alkali as the pancreatic juice. He is therefore inclined to explain the effect obtained by

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* Conf. this Journal, No. xlix. p. 228. 1860.

Corvisart and others as caused by the decomposition of the ferment contained in the pancreatic fluid, which decomposition is known to take place very easily.*

II. BLOOD; CIRCULATION; RESPIRATION; VOICE.

1. LISTER: *Notice of Further Researches on the Circulation of the Blood.* (Edinb. Monthly Journal, No. liv. p. 536, 1859.)
2. ARNOLD: *On the Continuation of the Irritability of the Heart and Muscles of the Limbs of the Frog in the Vacuum.* (Heidelberg, 1858; and Schmidt's Jahrb., vol. cv. p. 19, 1860.)
3. VULPIAN: *On the Continuation of the Contractility of the Heart and large Vessels after Death.* (Gaz. de Paris, 31 and 33; and Schmidt's Jahrb., vol. cv. p. 20, 1860.)
4. CZERMAK and PIOTROWSKI: *On the Duration and Number of the Contractions of the Excised Rabbit's Heart.* (Sitzungsber. der k. k. Akad. der Wissenschaften, vol. xxv. p. 431; and Schmidt's Jahrb., vol. cv. p. 17, 1860.)
5. TURNER, WILLIAM: *Remarks on the Musculus Kerato-cricoideus, a Muscle of the Larynx (Merkel's Muscle).* (Edinb. Monthly Journ., No. lvi. p. 744, 1860.)
6. BUDGE: *On the Influence of the Pneumogastric Nerve on Respiration.* (Vide sub 'Nervous System.')
7. EINBRODT: *On the Influence of the Pneumogastric Nerves on the Movements of the Heart.* (Vide sub 'Nervous System.')
8. MEYER, H.: *On the Influence of the Nerves on the Colour of the Venous Blood.* (Sub 'Nervous System.')

Lister communicates several facts which appear to him incompatible with the theory that the fluidity of the blood within the vessels of the living animal depends on the presence of a certain amount of ammonia holding the fibrin in solution, and that the escape of the volatile alkali leads to coagulation. Thus the blood is in general found coagulated in the heart and great vessels soon after death, while it remains fluid for days in the smaller vessels, though under circumstances favourable to the escape of ammonia. Further, if a vessel, either in an amputated limb or in a living animal, is treated in a manner calculated to destroy its vital properties, the blood coagulates in the injured part, but retains its fluidity elsewhere, although there is no greater opportunity for the escape of ammonia in the one case than in the other. Lister demonstrated also, "that ordinary solid matter, unlike atmospheric air, induces coagulation of blood in its vicinity, when introduced within the living vessels." While Richardson explains the fact that blood does not coagulate below a temperature of 40° Fahr. by the hypothesis that the low temperature prevents the evolution of ammonia, Lister showed, on the blood of the horse, that even after the addition of dilute acetic acid, in sufficient quantity to render the blood distinctly acid, this did not coagulate as long as it was kept in ice-cold water, but coagulated in the usual manner after it had been removed into a warmer atmosphere. Lister concludes, therefore, that the ammonia theory does not explain the influence of temperature on coagulation, and whatever degree of truth it may contain is far from representing the whole.

On the continuation of the irritability of the heart in rarified air, Arnold communicates a series of experiments performed in the Physiological Institution at Heidelberg. The movements of the heart, whether still in connexion with or separated from the body, decrease in the same proportion as the rarefaction of the air increases, and *vice versâ*. The placing of boiled water underneath the receiver caused the movements of the heart to continue longer and to decrease less rapidly; but the removal of the moisture by means of chloride of calcium caused the cessation of the heart's actions at the degree of exhaustion corresponding to the barometric pressure of 6‴. The heart, after having been for a prolonged period in the rarefied air, and having become deprived of about 15 per cent. of its water, does not resume its action when air is readmitted. The contraction of the auricles lasts under the receiver longer than that of the ventricles, and it reappears also sooner after the admission of air. Mechanical and electric irritations often revive the heart's action when atmospheric air alone is without influence. Mechanical irritation did so after an hour's endurance of the vacuum; electrical irritation even still half an hour later. The introduction of indifferent gases (nitrogen and hydrogen) in the place of the atmospheric air did not cause a longer continuation of the heart's action than that experienced in the rarefied air. The author infers from this fact, that the influence exercised by the vacuum is not due to the rarefaction of the air, but to the abstraction of moisture and the privation of oxygen. Arnold attributes to the oxygen a twofold action in relation to the muscle—first, that it entertains the irritability by the oxidation of the muscular fibre; secondly, as an exciter, and as such to be replaced by artificial agents (mechanic and electric). He considers, therefore, oxygen as indispensable for the maintenance of the muscle, but is of opinion that even without it the muscle retains for some time its irritability.

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* Conf. this Journal, No. xlix. p. 225. 1860.

Vulpian's researches on the continuation of the contractility of the heart and great vessels after death show that Haller and Nysten have attributed to it too short limits. Thus Vulpian observed undulations in the fibres of the auricles and vena cava inferior of a rat forty-six hours and a half after death, the fibres of the ventricles having ceased to exhibit this phenomenon a short time before. The atmospheric temperature was low, but above the freezing point. In a dog the ventricles showed distinct undulations about twenty-four hours after death, the right auricle even seventy-two hours and a half, and on a small spot even ninety-three hours and a half after death. The temperature was as in the previous experiment. Vulpian has no observations of his own on man. He corroborates the fact mentioned by Brown-Séquard, that a low temperature, as long as it does not sink below the freezing-point, favours a longer continuation of the contractility. Moisture and exposure to the atmospheric air are likewise mentioned as favourable influences. Zermak and Von Piotrowski's experiments on the rabbit's heart, removed from the living body, lead to the following inferences: 1. The rabbit's heart can, in a middle temperature, continue to beat for more than half an hour after it has been cut out; the average from sixty experiments was 11 minutes 46·33 seconds. 2. The heart can perform still more than seven hundred contractions, the average being 332·4. 3. Under the same circumstances the cut-out heart of the male animal beats longer and more frequently than that of the female. 4. There appears to be no relation between the duration of the heart's action and the size and weight of the animal. 5. Slight variations of temperature have no appreciable influence. 6. The heart cut out after previous electric irritation of the pneumogastric nerves beats rather longer and more frequently than the heart cut out after previous section of the pneumogastric nerves. 7. The heart simply cut out—that is, without either previous irritation or section of the pneumogastric—appears to exhibit an intermediate action.

Turner's researches relate to an occasional muscle of the larynx, described first by C. Merkel, of Leipsic, in a treatise 'On the Anatomy and Physiology of the Organs of the Voice and Speech' (1857). This muscle (*musculus Kerato-cricoideus; Horn-Ringknorpel-Muskel*) is described "as a muscular slip occasionally extending between the posterior surface of the cricoid cartilage and the posterior margin of the inferior cornu of the thyroid, and thus forming one of the intrinsic muscles of the larynx." Turner found it in seven out of thirty-two bodies examined, "being in a ratio of 21·8 per cent." In four of these seven it was on the right side only, in two on the left, and in one on both sides, while Merkel never had found it on both sides. Turner found it as well in males as in females. The existence of this muscle is not necessarily coincident with a general laryngeal muscularity. "The inferior laryngeal nerve passes under—i.e., in front of—this muscle, and sends a small filament to it." "With regard to its function," the author argues, "it must be evident that it is not essential to the production of the voice, seeing that it is absent in the majority of persons. We cannot, however, doubt that in those cases in which it exists it determines certain modifications of sound; for an organ so delicately constructed as the human larynx, and sounds capable of such varying modulation as those of the human voice, depending for their production upon such minute alterations in the relative positions of the vocal cords, will necessarily be more or less affected by the contractions of muscular fibres which, from their attachments, are capable of changing the relative position of the cords to each other."

III. Absorption; Secretion; Excretion; Metamorphosis of Matter.

1. Léconte and Démarquay: *Chemical Researches on the Physiological and Pathological Action of Gases Injected into the Tissues of Living Animals.* (Arch. Gén. de Méd., p. 545, November, 1859.)
2. Budge: *On the Direction of the Biliary Ducts.* (Archiv f. Anatomy and Physiology, p. 642, Jahrgang, 1859.)
3. Reichert: *Note on the preceding Paper of Budge.* (Archiv f. Anatomy and Physiology, l. c., p. 656.)
4. M'Donnell: *On the Physiology of the Diabetic Sugar in the Animal Economy.* (Dublin Quarterly Journal of Medical Science, No. lv. p. 160, 1859.)
5. Harley, G.: *On the Saccharine Function of the Liver.* (Proceedings of the Royal Society, vol. x. p. 289, 1860.)
6. Herrmann: *On the Influence of the Dilution of the Blood on the Secretion of the Urine.* (Virchow's Archiv, vol. xvii. p. 451, 1859.)
7. Roberts: *Observations on some of the Daily Changes of the Urine.* (Edinburgh Monthly Journal, March and April, 1860.)
8. Meissner, G. H.: *De Sudoris Secretione.* (Diss. Inaugur., Leipsiæ, 1859; and Schmidt's Jahrb., vol. cv. p. 1, 1860.)
9. Luschka: *The Coccygean Gland of Man.* (Virchow's Archiv, vol. xviii. p. 106, 1859.)
10. Hoppe: *Researches on the Constituents of the Milk.* (Sub I.)
11. Nasse: *Contribution to the Physiology of Bile.* (Sub I.)
12. Hoppe: *On the Chemical Composition of the Cerebro-spinal Fluid.* (Sub IV.)
13. Funke: *On the Reaction of the Nerve Substance.* (Sub IV.)

Léconte and Démarquay have made numerous experiments on animals regarding the absorption and exhalation of gases. The peritoneum and subcutaneous cellular tissue were the localities selected for the injection of various gases. We must refer to the essay itself for the description of the experiments, confining ourselves to the communication of some of the inferences arrived at by the authors:—1. Atmospheric air, nitrogen, oxygen, carbonic acid and hydrogen, have no injurious effect when introduced into subcutaneous cellular tissue or the peritoneum. 2. These gases are absorbed in a shorter or longer space of time, varying from forty-five minutes (carbonic acid) to several weeks (nitrogen). They stand, with regard to the rapidity of absorption, in the following order—carbonic acid, oxygen, hydrogen, atmospheric air, nitrogen. 3. Any gas injected into the cellular tissue or the peritoneum causes the exhalation of gases contained in the blood and in the tissues. 4. Thus, after the injection of any gas, a mixture of several gases is effected, and the absorption does not take place until the gas is mixed in certain proportions with the other gases exhaled. 5. The exhalation of gases appeared to be greater in the experiments made during digestion than in those made during fasting, and greater into the peritoneum than into the cellular tissue. 6. The rapidity of absorption did not appear to be influenced by the state of fasting or digestion. 7. Of all the gases injected, hydrogen produced the greatest amount of exhalation of gases from the blood. 8. The rapidity of absorption of gases is not always in proportion to their solubility in water (nitrogen and hydrogen). 9. Although the injection of atmospheric air into the cellular tissue and the peritoneum leads always to the absorption of oxygen and the exhalation of carbonic acid, yet this process is not identical with that in the pulmonary respiration, as after the injection of air the proportion between the oxygen absorbed and the carbonic acid exhaled is variable. 10. The rapidity of absorption and exhalation of gases in these experiments appeared to take place according to their solubility in the blood, and the proportion of these gases contained in the atmospheric air.

Budge contributes the results of his researches on the relation of the bile-ducts to the hepatic cells, and on the minute structure of the hepatic lobules in general. His observations are made on the livers of the calf, sheep, and rabbit. For the methods of injection used we must refer to the original. Regarding the description of what the author has seen, we will give, as much as possible, his own words. "According to my observation," he says, "the bile-ducts, after having reached the diameter of $\frac{1}{200}'''$ to $\frac{1}{250}'''$, do not become dilated, but, on the contrary, become abruptly narrowed to the diameter of $\frac{1}{500}'''$, forming a network which I have often been able to trace to the immediate neighbourhood of the vena centralis. On the minutest branches I have, though rarely, still seen nuclei, and have always convinced myself of the double contours." (p. 650.) "There exists, therefore, in the lobules, a double capillary system, the one formed of channels carrying blood, the other of those carrying bile. The whole space left within this vast network appears to be altogether occupied by hepatic cells." Budge never found any membrane round the hepatic cells; he denies, at all events, the existence of any membrane ("basement membrane") around them, forming the continuation of the walls of the bile-ducts. The author does therefore not adopt the well-known view laid down by Lionel Beale, in his excellent work 'On the Anatomy of the Liver.'* What Beale considers to be the basement-membrane round the hepatic cells, Budge describes as narrow gall-ducts. While the former lets the cells lie within the cavities of the dilated tubuli, the latter places them in the meshes between the narrowed gall-ducts.

Reichert refers in his remark on Budge's essay to a communication of his on this subject in Müller's Archiv for 1854. He compares now, as then, the terminations or roots of the hepatic duct to the terminating branches of the arteries, or the roots of the veins in the vascular cavernous bodies. The walls and septa of this glandular cavernous system (the tunica propria of glandular ducts) are, according to him, analogous to the walls and septa of the vascular cavernous systems. As, Reichert maintains, the cavernous enlargements (*Hohlräume*) of the corpus cavernosum penis are filled with blood, thus the analogous spaces in the liver are filled with hepatic cells.

M'Donnell gives a faithful account of the history and present condition of our knowledge of the origin of sugar, and the changes to which it is liable in the animal economy. He pays especial attention to the so-called sugar-forming function of the liver, and by repeating Pavy's experiments* arrives at an inference similar to that drawn by the just mentioned physiologist—viz.: "That the liver exercises a special function in forming a substance, which happens to be with extreme facility, by a process allied to fermentation, convertible into sugar. The material in question (amyloid substance of the liver) is always present in the hepatic tissue in the healthy state. During life and health it seems able to resist transformation into sugar. With the destruction of life, and, as a consequence of certain injuries and diseased states, this power of resistance diminishes, or ceases to exist, and saccharine matter appears in the structure of the liver and in the blood; while under normal circumstances the blood circulates through the liver and escapes charged with, at most, an exceedingly minute amount of sugar."

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* Conf. this Journal, No. xxxviii. p. 405. 1857.

The results of Harley's experiments, on the other side, are not in favour of the opinion that sugar is not formed in the healthy liver during life. Harley draws the following conclusions: "1. Sugar is a normal constituent of the blood of the general circulation. 2. Portal blood of an animal on mixed diet contains sugar. 3. Portal blood of a fasting animal, as well as of an animal fed solely on flesh, is devoid of sugar. 4. The livers of dogs contain sugar, whether the diet is animal or vegetable. 5. Under favourable circumstances, saccharine matter may be found in the liver of an animal after three entire days of rigid fasting. 6. The sugar found in the bodies of animals fed on mixed food, is partly derived directly from the food, partly formed in the liver. 7. The livers of animals restricted to flesh diet possess the power of forming glycogen, which glycogen is, at least in part, transformed into sugar in the liver; —an inference which does not exclude the probability of glycogen (like starch in the vegetable organism) being transformed into other materials besides sugar. 8. As sugar is found in the liver in the moment of death, its presence cannot properly be ascribed to a post-mortem change, but is to be regarded as the result of a natural condition."

Hermann examined, through experiments on dogs performed with F. Hoppe's assistance, the influence of dilution of the blood on the secretion of urine. It will be remembered that Kierulf,† who occupied himself with the same question, found that considerable dilution of the blood produces at first the passage of albumen through the kidney, and only, if further increased, also that of blood-globules. Hermann, on the contrary, never observed from dilution of the blood, the passage of albumen alone into the blood, but when the dilution had been carried to a high degree, albumen and hæmatin (not entire blood-globules) were constantly discharged simultaneously. About twelve hours after the injection of water into the jugular vein, the urine used to resume its normal colour. The albumen, thus passing through the kidneys, is considered to be derived from the globulin of blood-globules, not from the albumen of the serum. Another effect of the dilution of the blood was the appearance of biliary pigment in the urine, and this always preceded the appearance of hæmatin. This fact may be regarded as a corroboration of Kühne's and Zenker's‡ inferences, that the blood-pigment and bile-pigment are intimately connected with each other.

Roberts contributes further valuable researches on the physiology of the urine. As the principal object of his paper, the author states the consideration of some of the variations which the urine in health undergoes, at different parts of the same day, from food, drink, and sleep, but in particular from food. The observations were made on a single individual, a healthy man, twenty-eight years of age, taking moderate exercise, living in favourable hygienic conditions, and weighing 144 lbs. "In order to ascertain the nature and exact amount of the diurnal changes undergone by the urine, it was thought essential to collect the secretion at each hourly period succeeding a meal. At periods more remote from meal-times the secretion was usually collected every two hours. The period of sleep (six hours) constituted a single observation." The subject of experiment "rose at seven, breakfasted at eight, dined at two, sometimes at four, and took no further solid food until next morning. He retired to rest at one in the morning." The properties of the urine especially considered are: the quantity, the density, the solid constituents, the reaction, and the appearance of the urine. 1. With regard to the *quantity*, the author of course observed great oscillation. As long as the meals remained the same, there was after each meal, but especially after dinner, a considerable increase of the hourly flow; but as fasting continued, the flow steadily diminished until the next meal. The effect of fluid taken appeared to the author much less striking, when the system was in need of water, as after rising, than when "no lack of water was to be supplied," as after an early dinner. He found that when the blood was overcharged with water, the excess was not gradually but suddenly expelled. The kidneys are considered as the true regulators of the aqueousness of the blood, separating "at a rate precisely conformable to its concentration." Roberts does not regard the lungs and skin as aiding the kidneys in this function, as the healthy kidneys, according to him, require no such aid. 2. Under the head of *density*, the author examined the hourly specific gravity at different periods of the day. "The highest numbers were always found at periods the most distant from meals,—that is, during the night and before breakfast. At these times the density usually oscillated between 1026 and 1030." Densities ranging from 1004 to 1007 occurred frequently after dinner; but the urine never continued for two hours successively in such a watery condition, except from repeated potations. 3. The *solid constituents* "were not estimated by a direct method, but by a calculation from the density, according to Christison's formula." The variations in the solid matters appeared to take place with great regularity, and to have a direct relation to the times of the meals, and also the conditions of sleeping and waking. "It was found that the hourly discharge of solid urine increased shortly after taking food in a very marked manner; and that after prolonged fasting it fell off in an equally remarkable degree; and that during sleep it sank to a considerably lower point still." The author explains the influence of the meals by the progress of absorption. 4. The results of the author's researches on the *acidity* or *reaction* of the urine, we have chronicled in the last Report.* We will only add that though he regards the depression of the acidity as of universal occurrence, yet he acknowledges the existence of great differences in the intensity of the phenomenon in different individuals. He is inclined to attribute these differences to peculiarities of constitution, and especially to differences in the amount of the insensible perspiration, in the degree of exaltation taking place in the respiratory changes after meals; and in the energy of digestion and absorption. The quality of the meals, the interval between the last and the preceding meal, the state of sleep or waking, are likewise mentioned as being of influence. 5. Concerning *the appearance of the urine,* Roberts does not agree with Prout's view, "that in a perfectly healthy condition of the urine, this secretion not only remains transparent after cooling, but continues transparent until it begins to suffer those spontaneous changes incidental to all fluids containing organized matters in solution." The author found, on the contrary, the highly acid and concentrated urine, separated early in the morning, after eight or ten hours' fasting, "*nearly invariably*, to become sedimentary on standing a few hours; and usually even on mere cooling." The occurrence of such deposit does, however, not indicate, as Bence Jones and other observers have already proved, an excessive discharge of uric acid; the alkaline urine after meals being even richer in uric acid. While the acid urine is very seldom turbid, *when passed*, the alkaline urine depositing earthy phosphates is always so, and does not exhibit an increase of sediment after standing. Roberts divides healthy urine into two classes: 1. *Urines of fasting* (*urinæ sanguinis*) being "highly acid, inclined to deposit urates on cooling, but always clear on passing; apt also to be high coloured, especially during sleep. Estimated according to the amount of solid constituents discharged per hour, they are scanty." 2. The *urines of food* (*urinæ cibi*) "fall into two well-marked varieties—those with a *diminished acidity* and those with a *restored acidity*. Both varieties are of weak acidity and abundant in quantity. They show no tendency to deposit urates on cooling, although they are rich in uric acid. They are rich in earthy and alkaline phosphates also; and the alkaline variety is usually turbid when passed." The urine of morning micturition, having been collected in the bladder during several hours, is in general a mixture of several kinds.

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* Conf. this Journal, No. xlv. p. 233. 1859.

† Ibid., No. xxv. p. 265. 1854.

‡ Ibid., No. xlix. p. 240. 1860.

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* Conf. this Journal, No. xlix. p. 238. 1860.

The principal fact contained in the dissertation of Meissner, who was assisted in his researches on transpiration by Funke, consists in the discovery that the cutaneous secretion exhibits, after the ingestion of benzoic acid, distinct traces of hippuric acid. Schottin found under similar circumstances only benzoic acid, but after the discovery of Kühne and Hallwacks, that benzoic acid is within the liver transformed into hippuric acid, it is improbable that benzoic acid should pass as such through the skin.

Luschka describes an oval, yellowish red body, of the size of a small pea, situated close to the point of the os coccygis, often enveloped by fat, as the *coccygean gland* (*glandula coccygea*) of man. A more accurate examination shows that this organ is composed of five or six millet-like bodies, connected with each other by loose areolar tissue. These small bodies exhibit under the microscope a stroma of dense fibres, between which are situated vesicles and tubes, single and divided, with bulbous ends. The contents of these vesicles and tubes are of cellular nature (nuclei and cells of various shape and size). The coccygean gland is richly provided with bloodvessels, most of which are derived from the arteria sacralis media, while some of them issue from the rete arteriosum coccygeum. Like the suprarenal capsules, this coccygean organ receives an exceedingly large supply of nerve-fibres, which are given off either by the ganglion coccygeum, or when this is wanting, by the loop-like communication of the lower end of the sympathetic nerve. Some of the nervous fibres in the coccygean gland have a club-like termination. The author draws attention to the fact that the sympathetic nerve appears to be, as well at its lower as also at its upper extremity (pituitary gland), connected with a glandular organ. He is inclined to consider the coccygean body as a vascular gland, but is of opinion that further researches, as well on different animals as also with regard to the different stages of development, are required in order to throw light on the anatomical and physiological importance of the organ in question.

IV. NERVOUS SYSTEM.

1. HOPPE, F.: *On the Chemical Composition of the Cerebro-spinal Fluid.* (Virchow's Archiv, vol. xvi. p. 39, 1859.)
2. FUNKE: *On the Reaction of the Nervous Substance.* (Archiv f. Anatom. und Physiol., Jahrgang, 1859, p. 835.)
3. BROWN-SÉQUARD: *Experimental Researches on the Physiology of the Medulla Oblongata.* (Brown-Séquard's Journal de Phys., vol. iii. p. 151, 1860.)

4. **Van Kempen**: *Experimental Researches on the Transmission of Sensation and Movement in the Spinal Marrow.* (Bullet. de l'Acad. Roy. de Méd. de Belgique; and Brown-Séquard's Journ. de Phys., vol. ii. p. 517, 1859.)
5. **Van Deen**: *On the Insensibility of the Spinal Marrow for Foreign Impressions.* (Moleschott's Untersuchungen z. Naturlehre, vol. vi. p. 297, 1860.)
6. **Budge**: *On the Influence of Irritation of the Pneumogastric Nerves on the Acts of Respiration.* (Virchow's Archiv, vol. xvi. p. 433, 1859.)
7. **Einbrodt**: *On the Influence of the Pneumogastric Nerves on the Motion of the Heart in Birds.* (Archiv f. Anat. und Physiol., Jahrgang 1859, p. 439.)
8. **Meyer, H**: *On the Influence of the Nerves on the Colour of the Venous Blood.* (Arch. f. Anat. und Phys., Jahrgang, 1859, p. 409.)
9. **Gluge and Thiernesse**: *On the Union of Sensitive Nerve-Fibres with Motor Fibres.* (Bullet. de l'Acad. Roy. de Belgique. Second Series. Vol. vii. No. 7.)

Hoppe examined the fluid obtained by punction in several cases of spina bifida. The fluid was transparent, strongly alkaline, of very low specific gravity, contained a small quantity of albumen (between 0·025 and 0·246 per cent.), and, in all, only between 1·0 and 1·3 per cent. of solid constituents, the greater part of which consisted of soluble salts. Several times, but not constantly, Hoppe obtained a positive result with regard to the presence of sugar, as far as Trommer's test gives this. The fluid of internal hydrocephalus was likewise repeatedly examined by the author. In one case the specific gravity of the fluid obtained after death was 1·001, the solid constituents amounted to 1·252 per cent.; Trommer's test yielded a negative result. In a second case of hydrocephalus, the fluids examined were obtained by repeated punctions. The fluid of the first operation contained a very small amount of albumen (0·1 per cent.), and reduced as well the oxide of copper, as also the oxide of bismuth. The fluid of the third operation yielded a much larger proportion of albumen (1·1 per cent.) and of solid constituents, but no trace of sugar (Trommer's test). It may be supposed that this change in the composition of the fluid was due to the accession of inflammatory processes in the walls of the cavities.

Funke's researches render it very probable that the reaction of the nerve substance during life is neutral, except after exhausting activity, when it is found acid. These researches were made on rabbits and frogs. In order to avoid exhaustion of the nerve-substance through the convulsions of agony, and on the whole through increased nervous activity preceding death, he killed some animals by strong doses of urari. Transverse sections of the spinal marrow and the ischiadic nerves exhibited under such circumstances always a neutral reaction. About eighteen or twenty hours later, the reaction was found acid, which acid reaction increased for some time, until putrefaction set in, which was accompanied by an alkaline reaction. Elevated temperature accelerated the appearance of the acid reaction. Nervous exhaustion in animals was produced by strychnia. The examination of the nerve-substance in such animals immediately after death showed a decidedly acid reaction. The influence of exhaustion was proved in a striking manner by the section of all the roots of the ischiadic nerve of one side previously to the introduction of strychnia into the system of the animal. While the reaction of the ischiadic nerve on the side of the section was neutral, that of the spinal marrow and the other ischiadic nerve was strongly acid. Funke points to the analogy existing between the nerve and muscle with regard to reaction, as Du Bois has proved, that the muscle too has during life no acid reaction, as we were taught by Liebig; but that its reaction is neutral, and becomes acid only by exhaustion and by decomposition after death. The analogy becomes still more striking, if we consider that the nerve-substance, too, yields, amongst its extractive matters, kreatin, inosit, and hypoxanthin. With regard to the nature of the acid, Funke believes it to be lactic acid. Funke is inclined to explain the difference in the reaction of the nerve and muscle in the normal state and in the state of exhaustion or after death, by the view, that the acid is produced under all circumstances as a product of metamorphosis, but that in the normal condition it is destroyed by the electric currents created in the nerves and muscles, which currents are wanting in the state of exhaustion and after death. It may, however, be just as well supposed that the acid normally developed is, in the usual condition, either absorbed as soon as it is formed, or neutralised by the alkaline constituents derived from the blood-plasma.

Brown-Séquard in a former memoir has proved that the views generally entertained regarding the so-called "vital point" were incorrect. In the present paper on the medulla oblongata, he endeavours to show that the phenomena observed in cases of sudden death from injury to the medulla oblongata, are not due to *suspension of action*, but to *irritation* of that portion of the nervous centre. Thus—1. The stoppage of the heart's action through lesion of the medulla oblongata is caused by irritation, and not by want of action of the medulla oblongata, in the same manner as irritation of the pneumogastric nerves produces likewise stoppage of the heart's action. 2. In part, the author maintains, the cessation of the respiratory movements is likewise attributable, not to want of action, but to irritation of the medulla oblongata. 3. The absence of the convulsions of the agony, too, in cases of sudden death from the medulla oblongata, is considered by Brown-Séquard as the effect of irritation, not of cessation of action.

Van Kempen has examined the laws for transmission of sensitive impressions through the spinal marrow to the brain, and of motor impulses from the brain through the spinal marrow to the periphery. The author communicates the results of his experiments according to the animals on which these were performed. I. On *frogs*—1. The transmission of sensitive impressions to the brain takes place in a crossed manner throughout the whole length of the spinal marrow. 2. That of voluntary movement, on the contrary, in a direct manner along the lumbo-dorsal portion of the spinal marrow, but in a crossed manner in the cervical portion.—II. In *pigeons*—1. The crossing in the transmission of sensation takes place along the whole of the spinal marrow. 2. The transmission of voluntary movement is direct in the lumbo-dorsal region, partially crossed in the cervical region.—III. In *mammalia*—1. The transmission of sensibility to the brain is again crossed in the entire length of the spinal marrow. 2. That of voluntary movement is direct in the lumbo-dorsal region; while in the cervical portion it is, to the greater part, likewise direct, to the smaller part, crossed.

Van Deen has already, almost twenty years ago, asserted, that the spinal marrow is insensible for mechanical irritation. Eckhard's* and Kölliker's† experiments regarding the influence of chemical agents on the motor nerves of frogs have induced Van Deen to examine the action of chloride of sodium on the spinal marrow of frogs. Referring for the description of the experiments to the paper itself, we give here Van Deen's inferences, which are quite in accordance with those pronounced by him in 1841—1. Neither mechanical nor chemical irritation applied only on the spinal marrow itself (without touching the nerves, still connected with the peripheric parts) is able to excite the action of the spinal marrow. 2. This action can be excited only by organic stimuli, which the spinal marrow receives either from the will or from the sensitive nerves.

The very different effects which, according to different observers, the same experiment—viz., irritation of the central end of the dissected pneumogastric nerves—produces on the phenomena of respiration, led Budge to resume his researches on this subject. It will be remembered that Traube, Lindner, Kölliker and Müller, Snellen, Gilchrist, and Funke assert, that irritation of the central end of the pneumogastic nerves arrests the respiration in the act of inspiration; that Eckhard and Budge found the arrest to occur in the act of expiration; while Helmot, Aubert, and Tschischwitz assume that slight irritation causes arrest during the inspiration, strong irritation during the expiration. After renewed experiments, Budge is of opinion that this discrepancy is explained by the existence of two nervous centres in the medulla oblongata in close proximity to one another, the one of them presiding over the expiration, the other over the inspiration; the former being the centre of the pneumogastic nerves, the latter being the well-known noeud vital or centrum respiratorium of Flourens. The author points to the analogy of the respiratory movements in this respect with the movements of the iris,* for which he has likewise established two centres, the one for dilatation being situated in the spinal marrow and acting from these through the sympathetic nerve, the other for contraction, having its seat in the corpora quadrigemina. As of these centres for the iris, that for dilatation seems to be in constant action, and appears not to require excitation by centripetal nerves, while the centre for contraction requires to be influenced by the optic nerve in order to produce a change in the action of the iris; thus Flourens' noeud vital, analogous to the spinal centre of the pupil, appears likewise to be in constant action, while the centre of the pneumogastric nerves, like the corpora quadrigemina for the iris, appears to act only when excited by the centripetal fibres of the pneumogastric nerves. The actions excited by these centres are antagonistic to each other. If the pneumogastric centre is irritated, or what is of the same import, the central ends of both pneumogastic nerves, then, by means of reflection, the expiratory muscles are brought into action. As long as the intensity of the irritation is too slight to overcome completely the inspiratory centre, the respirations become shorter but more frequent. If the irritation is increased to such a degree as to render the action of the expiratory centre equal to that of the inspiratory centre, there will be an arrest of the respiration half-way between inspiration and expiration. If the intensity of the irritation is still further augmented, the arrest will occur in the act of expiration. The consequences of section of both pneumogastric nerves are threefold—1. The centre of the pneumogastric nerves is deprived of its natural excitation, caused by the carbonic acid exhaled in the lungs, the expiratory movements necessary for the removal of the carbonic acid are wanting, the carbonic acid accumulates in the body, death is caused by carbonic-acid poisoning. 2. Through the want of action in the expiratory centre the antagonistic inspiratory centre predominates, the inspiratory movements become excessive, and even rupture of pulmonary vesicles and emphysema are produced. 3. The motor fibres for the rima glottidis are severed from their centre, the cordæ vocales become relaxed.

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* The Chemical Irritation of the Motor Nerves of Frogs: Zeitschrift f. rat. Med., new series, vol. ii. p. 303.

† On the Vitality of the Nerve Fibres of Frogs: Würzburger Verhandlungen, vol. vii. p. 145.

Einbrodt's experiments show that the heart bears in birds the same relation to the pneumogastric nerves as in mammalia. Electric irritation, as well of both pneumogastric nerves, as also of only one of them, arrested the heart's action completely; a fact which is opposed to Bernard's assertion, and in part also to R. Wagner's, who says, that in birds the retardation of the heart's action through the pneumogastric nerves is very incomplete. Edward Weber, however, remarked already in his essay on 'Muskelbewegung,' in Wagner's 'Handwörterbuch,' that the current of the rotation-apparatus applied to both pneumogastric nerves or to the medulla oblongata, effects the arrest of the heart's movements, not only in mammalia, but also in birds and frogs. Einbrodt further witnessed increased frequency of the heart's actions after section of the vagi, as well in birds as in mammalia.

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* Conf. this Journal, No. xxxvii. p. 252. 1857.

Gluge and Thiernesse have experimented on the obscure subject of the union of the sensitive nervous fibres with the motor fibres. The authors mention the previous experiments by Flourens, Schwann, Müller, and Bidder, relating to the same question, and then describe ten experiments of their own performed on dogs. The nerves selected were the hypoglossus and the lingual branch of the fifth pair; after the section of these nerves, the central end of the lingual nerve was fixed to the peripheric end of the hypoglossus, and in the greater number of the experiments the central end of the hypoglossus was shortened by a considerable piece, in order to avoid complication in the interpretation of the results. In general this operation was performed on both sides of the head, with an interval of from three to five weeks between the two operations. The first operation rarely caused any important derangement, while the second was followed by great difficulty in swallowing and masticating; the faculty of lapping was destroyed; the tongue became to some degree atrophied and contracted towards the bottom of the mouth; ulcers were regularly formed on the margins of the tongue, but healed again within some weeks. About three weeks after the operation, the central portion of the lingual—i.e., the sensitive nerve, was firmly connected with the peripheric portion of the hypoglossus—i.e., motor nerve; in the cicatrix nerve-fibres were perceived extending from the lingualis to the hypoglossus. Galvanic irritation applied to the central portion of the lingual nerve did not cause contractions in the tongue, except in one experiment, which the authors themselves consider as devoid of value on account of the nerve not having been sufficiently isolated during the experiment. The same irritation applied to the peripheric or central end of the hypoglossus, or to the cicatrix, caused decided contractions in the tongue. The central portion of the hypoglossus terminated in a swollen stump, from which emanated nerve-fibres, towards the peripheric part of the hypoglossus or the cicatrix, or of the adjacent muscles, but never towards the lingualis. The authors infer from these results: 1. That sensitive fibres cannot be transformed into motor fibres; 2. That the organic movement ("le mouvement organique") in the nerve-fibres affecting sensation must be different from that causing muscular contraction. It may be mentioned that Gluge and Thiernesse, in their just-mentioned experiments, witnessed the irritability of the nerve-fibres separated from their centres, to persist during four and even four and a half months.

H. Meyer mentions in a communication to Du Bois-Reymond that he made, already in 1844, some experiments which show the influence of the nervous action on the colour of the venous blood. Thus after section of the ischiadic nerve, the blood from a cutaneous vein in the neighbourhood was at first still dark, but a few minutes later it issued with a bright red colour, and continued to do so even after seven days. An analogous result was obtained in six experiments of the same or similar nature. Meyer does, however, not claim any priority regarding this observation, but remarks that Krimer,* as early as 1820, stated as the result of experiments, "that the bright red blood of the arteries passes as such into the veins, without becoming during its passage through the veins dark red, as soon as it is, by means of section or destruction of the nerves, deprived of the influence of the latter." These observations gain at present in interest through Bernard's discovery regarding the varieties in the colour of the venous blood of glandular organs, according to their condition of activity or rest.† Meyer mentions also observations of Dupuytren and Dupuy, Hallé and Pinol, and Emmert, that changes of the colour as well of the arterial as also of the venous blood occur under the influence of the pneumogastric nerves.‡

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* Physiologische Untersuchungen. Leipzig, bei Carl Cnobloch. 1820.

† Conf. this Journal, No. xliii. p. 226. 1858.

‡ Autenrieth's Archiv, Band ix. p. 380. 1809.

HALF-YEARLY REPORT ON MATERIA MEDICA AND THERAPEUTICS.

By Robert Hunter Semple, M.D.

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I. *On Iodism.* By Dr. Rilliet, of Geneva. (L'Union Médicale, March 6th, 1860.)

M. Rilliet, whose experience in Geneva gives him great opportunities for studying the effects of iodine, admits three kinds of poisoning by this drug. The *first*, which is produced by iodine or its compounds given in a large dose, is an acute form of poisoning admitted by all authors, and described by Orfila, Magendie, Devergie, and Ricord, consisting primarily of gastric disturbance, and in a few cases leading to fatal results. The *second* kind of poisoning is characterized by nervous and neuralgic symptoms, singing in the ears, convulsive movements, and iodic intoxication; also by disturbance of the secretions, coryza, ophthalmia, salivation, vomiting, diarrhœa, and cutaneous eruptions. It is further characterized by atrophy of the mammary glands and testicles. The *third* kind, less known than the foregoing, but particularly described by M. Rilliet, is the affection which has received the name of *constitutional iodism.*

The latter affection may exist in all degrees of severity, but for the purpose of description the author divides it into *slight iodism, iodism of moderate severity*, and *severe* or *very severe iodism.* In the slight cases, after the more or less prolonged use of iodine, the patients, after congratulating themselves on the diminution of their goitre (if they have suffered from that affection), soon begin to perceive that they have become thin, pale, and weak. This remark is more generally made by their friends than by themselves, as the preservation of their general health, and sometimes even the improvement of their appetite, deceives them as to their true condition. They are, however, soon attacked by palpitations, depression of spirits, sleeplessness, and other nervous symptoms, which will probably disappear on the discontinuance of the use of iodine. The continuance or aggravation of these symptoms characterizes the cases of *iodism of moderate severity.* In this form, the emaciation, the depression, the weakness, the want of sleep, and the palpitations increase, and some patients complain of painful sensations in the stomach and diaphragm, with constipation. These symptoms, however, are all removed under appropriate treatment, and especially by suspending the employment of the iodine. The *severe* or *very severe cases of iodism* are ushered in by symptoms similar to those of the cases last described, but they are rapidly manifested, and assume a very intense form. When a goitre exists, it diminishes and disappears in a few days, and this is a point particularly insisted upon by M. Rilliet. But at the same time the patient becomes emaciated with alarming rapidity, and in a few weeks or a few days it becomes impossible to recognise him; the emaciation is general, but is most marked in the glandular organs, the breasts, and the testicles. The pulse is accelerated, rather small than full, and more rapid at some periods than at others. The skin of the face is pale, yellowish or greenish, the features express sadness or anxiety; the eyes, which are sunk, are sometimes fixed, sometimes wandering. There is great weakness, the patients tremble, and are out of breath at the slightest movement, and their voice is broken. The nervous symptoms are strongly marked, there is a remarkable restlessness and irritability; and an extraordinary disposition to be alarmed at everything succeeds to mental repose, and the sleep is continually disturbed by nightmare. In the midst of all this disturbance the appetite remains, and is sometimes even greater than usual, and the patients are seldom confined to bed. When seen in this condition it might be supposed that death would be the consequence of the disease, but such is not the case, for a cure is the rule and death the exception. Still the cure is effected only after a rather long period, the ordinary duration of the complaint being from two to four or six months; sometimes, however, health returns after a few weeks, but for a long time afterwards the patient bears traces of the affection—in men, atrophy of the testicles, and in women, atrophy of the breasts, being often the permanent results. The most characteristic symptoms are rapid emaciation, coinciding with bulimia, which are the capital signs of constitutional *iodism;* and indeed the diagnosis is founded upon these signs, together with the absence of any organic lesion. An important circumstance in the prognosis is the age of the patient, for it is the more serious in proportion to the more advanced age. Although death from iodism is by no means frequent, it is nevertheless a very painful affection, for it injures the constitution, deprives its victims of all enjoyment of life for many months and even for many years, and often renders existence insupportable. With regard to the diagnosis, when the symptoms have begun rapidly, the acceleration of the pulse, its irregular movements, the paleness of the integuments, and the emaciation, may give rise to the suspicion, when the patients are feeble and nervous women, that the case is one of *false chlorosis,* simulating phthisis, an affection particularly described by M. Rilliet in 1855. But the history of the case will clearly distinguish its nature; and moreover as the use of iodine may give rise to chloro-anæmia, too great importance should not be attached to any chlorotic symptoms which may present themselves.

II. *On Iodism.* Discussion at the Académie de Médecine.
(L'Union Médicale, March 8th, 1860.)

According to the experience of M. Ricord, the iodide of potassium is most useful and efficacious in causing the rapid disappearance of all the symptoms for which it is prescribed; and a considerable physiological operation is likewise manifested in the increase of the appetite and the improvement of the digestion. The globules of the blood are increased, the strength is restored, and the weight is augmented, for M. Ricord has caused his patients to be weighed. He has also observed the disappearance, as if by enchantment, of chlorosis, syphilitic marasmus, palpitation of the heart, &c. If it should be urged that these good effects are observed only among the Parisians, M. Ricord answers, that he has treated patients from all parts of the country, from Switzerland, and even from Geneva, and that he has never observed any difference in the action of the iodide. Neither has he found that age, sex, or temperament exercised any influence over the production of the symptoms described by M. Rilliet. M. Ricord, however, does not allege that the use of iodide of potassium is never attended with inconvenience; he only maintains that the assemblage of symptoms grouped under the name of *iodism* by M. Rilliet, are very rarely observed. As to the atrophy of the breasts, M. Ricord has seen the fat disappear, but never the mammary gland itself; and as to atrophy of the testicles, he has never observed it except in circumstances where it might be explained by some morbid condition, such as syphilitic sarcocele, of which atrophy of the testicle is almost the inevitable result. M. Ricord admits that iodide of potassium is not suited to all cases, and some constitutions are insusceptible of its influence. Acute or chronic inflammation of the digestive canal contraindicates the use of iodine, which is also to be avoided in scurvy, in sanguineous or serous plethora, in hæmorrhages, &c. Admitting the truth of M. Rilliet's descriptions, M. Ricord attributes them in great measure to local and endemic influences, and he advises patients who require iodine as a medicine, to be treated out of Switzerland, and especially out of Geneva, where the air, the water, and the prevalence of goitre, appear to exercise an injurious influence upon the treatment, and to produce serious complications of disease. It should be mentioned, that M. Ricord prescribes iodide of potassium in doses varying from one to six grammes ($\frac{1}{4}$ of a drachm to ʒiss), while M. Rilliet has observed serious constitutional effects from doses which are almost Hahnemannic, but M. Puche is said to have raised the dose to fifty, eighty, or even one hundred grammes.

III. *On the Treatment of Prurigo.* By Dr. Von Bärensprung.

(Vierteljahschrift für die practische Heilkunde, 1860.)

Dr. Bärensprung is opposed to the use of stimulating agents in prurigo, and he considers that local anæsthetics, such as chloroform, are useless. On the contrary, cold baths and cold ablutions procure relief and quiet, while tepid baths, bran baths, and vapour baths allay the increased excitement. The patient's sufferings may also be relieved by anointing the skin with fatty matters and inunctions with lard. The preparations of sulphur, tar, and corrosive sublimate are specifics. Slight cases of prurigo are often cured by sulphur baths and sulphur ointments. In obstinate cases, Dr. Bärensprung obtained remarkable effects from baths of corrosive sublimate. The patient should take every second day, or at longer intervals, a bath at 95° Fahr. in which two drachms of the mercurial salt are dissolved, and in general six such baths are sufficient to effect a perfect cure. The absorption of the mercurial in this case is very trifling, and its action is chiefly local. The bathing vessel should be constructed of wood, and not of zinc or copper, because if these vessels are employed, the vessel itself is injured by the decomposition of the sublimate, and the bath is rendered inefficacious.

IV. *On the Employment of Gentian Root in Marsh Miasma.* By Dr. Chavasse, of the French Navy.

(L'Union Médicale, Jan. 21, 1860.)

Dr. Chavasse does not assert that gentian root is comparable to cinchona in the treatment of intermittent fevers; but the latter remedy is very dear, and is, moreover, daily becoming more scarce. He has, therefore, for the last eight years, been in the habit of prescribing gentian root, in French Guiana, in order to save the employment of cinchona. He used it as a preventive agent against marsh miasma, his object being to support the powers of the system so as to neutralize the effects of miasmatic absorption. In his own case, being exposed to the effluvia of marshes for four years, he hardly ever experienced any attacks of intermittent fever, or at most he felt only the precursory symptoms of such an affection, the paroxysm of which was, however, cut short by merely doubling the dose of gentian. Dr. Chavasse prescribed the remedy in many other cases, and the result was always the same—namely, the miasmatic poisoning was everywhere neutralized, whatever might have been the idiosyncrasies of the persons infected. But in order to derive from its use all the advantages which it is capable of affording, it must be administered early, before any pathological manifestation of marsh-fever is developed, for it is especially a prophylactic agent. The mode of administration is to prepare an alcoholic tincture, made by steeping thin slices of gentian-root in spirits of wine, and to give it in brandy. A small wine-glassful is given once or twice a day in a little water, and it constitutes a very agreeable drink. The addition of alcohol is important, for it excites the energies of the nervous system so as to make it accessible to the therapeutical operation of the gentian.

V. *On the Treatment of Pneumonia by Veratria.* By Professor Vogt, of Berne. (Bulletin Général de Thérapeutique, Jan. 30th, 1860.)

In a work lately published, M. Vogt gives the results of his experience in the treatment of pneumonia by veratrine. The number of cases treated from the beginning of 1857 to the end of March, 1859, was 56. Of these, 29 were cases treated in the first stage, 2 only being fatal. In the remaining 27 cases the properties of veratria were very strongly marked. On the fifth day of the disease the fever had generally disappeared, and the patients were becoming convalescent. Only in a small number of cases, towards the fifth or sixth day, there was a fresh exacerbation, but all the phenomena disappeared more rapidly than before by a fresh administration or a larger dose of veratria. In no case had the veratria any other effect upon the local lesion than that of suspending its progress as soon as the febrile excitement was arrested. In a second class of cases there were 22 in which the disease had passed the first period and presented itself with a fresh exacerbation; of these, two died. Considering this treatment in a general manner, M. Vogt observes, that when applied to well-developed and serious cases of pneumonia, veratria has afforded very satisfactory results, as there were only 8 fatal cases out of 100; and his opinion is that the use of this drug ought not only to be ranked upon an equality with other approved methods of treatment, but that it is actually superior to them. The objection has been raised against the use of veratrine that it often readily produces vomiting, and it has also been alleged that its action often becomes excessive. But M. Vogt does not consider these objections as having much weight; for as to its emetic powers, it possesses them in common with tartarized antimony, and ordinary experience proves the utility of vomiting in a number of affections of an inflammatory nature. As to the activity of its operation, it may be moderated by regulating the dose, and by carefully watching the effects produced, as in the case of other medicines. In small doses it has no action on the pulse, and in sufficient doses it never acts excessively, according to M. Vogt, when it is administered with suitable precautions. The rules laid down by M. Vogt are, to give the veratria in a rather large dose—namely, 5 milligrammes (a milligramme is ·0154 of an English grain) every two or three hours, until the production of vomiting or the diminution of the pulse. The veratria is generally administered in pills; but some persons are unable to swallow pills, and the alkaloid must then be given in solution. The necessary dose for procuring the desired effect is from 25 to 30 milligrammes; but there are persons of less sensitive organization, principally men, in whom as much as 5 to 6 centigrammes (a centigramme is ·1543 of an English grain) may be given in twenty-four hours. If the stomach is too irritable, the dose is reduced, and the veratia is administered in an effervescing draught or with a little opium; the action of the pulse is more slow in developing itself, but it is nevertheless observed at last.

VI. *On the Therapeutical Methods of preventing Pitting of the Face in Confluent Small-Pox.* By Dr. Stokes. ('Dublin Quarterly Journal of Medical Science,' February, 1860.)

During the last five years Dr. Stokes has employed gutta percha and collodion in a considerable number of cases of confluent small-pox, for the purpose of preventing pitting of the face. In most of the cases the crust came off in large flakes or patches, composed of the dried exudations and the covering material, leaving the skin uninjured. This kind of treatment was most successful in cases of a typhoid character, but appeared to be not so well adapted to those presenting a more sthenic type. Dr. Stokes considers that the application of poultices over the face is the surest method of preventing disfigurement in small-pox. Their use should be commenced at the earliest period, and continued to an advanced stage of the disease. In most cases they may be applied even over the nose, so as to cover the nostrils. This plan should fulfil three important indications of treatment—namely, to exclude air, to moderate the local irritation, and to keep the parts in a permanently moist state, so as to prevent the drying and hardening of the scabs. The best poultice is formed of linseed meal, which should be spread on a soft material, such as French wadding, and covered with gutta-percha paper or oiled silk. The conclusions to which Dr. Stokes arrives are the following: 1. That the chances of marking are much greater in the sthenic or inflammatory than in the asthenic or typhoid confluent small-pox. 2. That, considering the change in the character of disease observed during late years, we may explain the greater frequency of marking in former times. 3. That in the typhoid forms of the disease the treatment of the surface by an artificial covering, such as gutta percha or glycerine, will often prove satisfactory. 4. That in the more active or non-typhoid forms the use of constant poulticing, and of every other method which will lessen local inflammation, seems to be the best mode of preventing disfigurement of the face.

VII. *On a Case of Extensive Abscess, treated by Iodized Food and Injections.* By Dr. Ameuille. (L'Union Médicale, December 20th, 1859.)

The case was that of a lady, thirty-eight years of age, of a lymphatic, scrofulous temperament, who, after having suffered for some time under a painful affection of the right hip, was at last confined to bed, suffering under hectic fever, and presenting a large abscess at the external and upper part of the thigh. This abscess having been opened by incision, and the pus discharged, an injection of iodine, consisting of equal parts of tincture of iodine and solution of iodide of potassium, was thrown into the cavity. The internal treatment consisted of a tonic regimen and the use of iodized food, according to the method recommended by M. Boinet, the iodized bread being taken for a few days, and the iodized wine for a much longer period. Under the influence of this local and general treatment, a most remarkable and rather sudden change was observed in the patient's health, the pains diminished, together with the swelling of the limb, the fever ceased, and the appetite returned. A month afterwards, the patient had recovered her healthy appearance, as well as her strength and stoutness, and twenty-five days after the first injection, she was able to go out, and gradually became able to walk. The result was complete recovery. Dr. Ameuille remarks that in this case the patient, who was nearly forty years old, took iodine for more than three months and a half without suffering the slightest inconvenience, and none of the phenomena of iodic poisoning described by some physicians ever presented themselves. On the contrary, the patient experienced a marked improvement, and became fat and healthy-looking. He also remarks that the medicine was administered with facility, and that the patient was unaware that she was taking it until she was apprised of the fact.

VIII. *On the Employment of Chloride of Zinc in Diseases of the Skin.* By Dr. Veiel, of Cannstatt. (Zeitschrift der Gesellschaft der Aertze zu Wien, February 20th, 1860.)

Dr. Veiel has employed the chloride of zinc for the last nine years as a caustic whenever it was requisite to destroy morbid growths in the areolar tissue, or to remove abnormal secretions, as happens in different forms of lupus. He therefore employed it for a long time only in the cure of lupus and some allied diseases, such as lepra vulgaris, elephantiasis, and small circumscribed forms of scirrhus; but latterly he has also used it for the purpose of altering the condition of suppurating surfaces, and in chronic ulcers of the legs, chronic eczema and sycosis. Three forms of this salt are in use, namely, the alcoholic solution, the aqueous solution, and the solid cylindrical form. The first consists of equal parts of rectified spirit and chloride of zinc, the second of 10 parts of the chloride, 10 of hydrochloric acid, and 500 of water, and the third is prepared by fusing the chloride, and pouring it into moulds, as in the case of caustic potash. Dr. Veiel selects the solid form when his object is to penetrate as deeply as possible in order to destroy hypertrophic secretions, as happens in inveterate cases of lupus, in which the stick of chloride is used in the same way as caustic potash. The chloride was thus employed with the best results in thirteen well-marked cases of lupus, 1 of the alæ nasi, 6 of the upper lip, 4 on the cheek, and 2 on the ear. The proceeding is as follows: when there are scabs or thick scales, which have already destroyed the epidermis, poultices are used to remove them, but when the epidermis is preserved, it is dissolved by blistering plaister or spirits of ammonia. Then the solid chloride, fixed in a quill and pointed, is pressed deep into the hypertrophied and tuberculous tissue and the structures for 2 or 3 lines around it, until the salt has penetrated all the morbid growths in different directions. Immediately after this operation, the honeycomb-like and perforated surface discharges a dark bloody fluid, succeeded by a brighter-coloured serum, which after a few hours hardens to a smooth and firm scurf. On the third or fourth day, a thin pus is formed on the edge of the scurf, and the removal of this fluid by puncture generally relieves tension. On the sixth or eighth day, the scurf is loosened at the edges, and it may be entirely removed by poultices continued for several days. It is seldom necessary to use the solid chloride more than three times, but in cases where the diseased structures are very thick, it must be employed much oftener. When the large ulcer is at last free from all swollen prominences, and on a level with the surrounding healthy parts, it should be poulticed for several days, then lightly touched with the alcoholic solution of the chloride every three or four days, and afterwards, when the edges begin to contract, with the watery solution, until a complete cure is effected, which seldom requires more than three or four months.

Besides lupus, there are a great number of skin diseases which are relieved by chloride of zinc. In obstinate eczema, occurring on the limits of the skin and mucous membrane, as on the eyelids, the lips, the labia, and the anus, the spirituous solution affords great relief. In eczema solare and impetiginodes, the daily employment of the aqueous solution is sometimes the only cure. In psoriasis, some indurations are occasionally left, after the cure of the complaint, on the elbows, back, and thigh, but they are easily removed by the alcoholic solution of the chloride, although the scales must first be removed. There is also a form of psoriasis palmaris, with painful warty indurations, which yield to no other means than the solid chloride, after they have been previously raised from their source by a blister. In sycosis and favus, after the beard or hairs are removed, the watery solution is very useful, partly in dissolving the swelling and infiltration of the follicles, partly in removing fungous growths. It is also useful in certain forms of acne, and in a great number of warty circumscribed scirrhous growths on the nose, the cheeks, and the lips.

Dr. Veiel considers that chloride of zinc is especially useful as a caustic, on the following grounds: 1. It enters into combination with all the elements with which it comes into contact, particularly with the proteinaceous matters, which again occasion a caustic effect upon the deep structures, whereby the parts in the immediate vicinity of the cauterized matter contract, and thus the diseased portion is diminished, and the edges of the sound parts approximate. 2. Because the irritation thus excited causes a more rapid formation of pus and dissolution of the scurf, whereby the cure is more rapidly accomplished, and the raw surfaces form better granulations. 3. Because the cicatrization following the peculiar contraction, the attendant destruction of the disease is more complete; and 4. Because the pain of the application, although severe, lasts only a short time, and may be easily moderated by chloroform. Dr. Veiel considers, for various reasons, that chloride of zinc is preferable to the strong acids, caustic potash, nitrate of silver, the preparations of iodine, the chloride of gold, and other caustics. It should be mentioned that as the chloride of zinc in the solid form is remarkably prone to attract moisture, it ought to be kept for use in a well-stopped glass vessel.

IX. *On the Properties of Kawa or Ava Root* (*Piper Methysticum*). (Bulletin Général de Thérapeutique, January 30th, 1860.)

The species of pepper known by botanists under the name of *Piper Methysticum* is celebrated in almost all the islands of the South Sea, where it is called *Kawa* or *Ava*. The root, either fresh or dry, has served from time immemorial for the preparation of a drink which, before the habitual intercourse of the tribes of Oceania with the Europeans, constituted the favourite beverage of these islanders. When macerated with water, it furnishes a beverage which the natives consume with pleasure, because it plunges them into a kind of intoxication or special excitement. The smell and taste of the root are slightly aromatic; and when masticated, it is rather acrid, astringent, and sialogogue. M. Gobley has lately described this root to the French *Société de Pharmacie*, and has analysed its chemical composition. He finds it to contain water, cellulose, starch, a peculiar substance which he calls *Methysticine*, acrid and aromatic resin, extractive and gummy matter, and a few salts. The root of kawa exercises a well-marked therapeutical action. It is said to be one of the most powerful sudorifics yet known, and to participate in the nature of the peppers by the influence it exercises in the cure of catarrhal affections, and especially blennorrhagia. Its chemical composition resembles that of the peppers, although it differs from them in several respects, and among others in the special properties of the particular principle (methysticine) which it contains.

X. *On the Treatment of Diphtheria.* By Dr. Gendron, of Château-du-Loir. (L'Union Médicale, March 8th, 1860.)

Dr. Gendron, after briefly noticing the different kinds of treatment which have been recommended in diphtheria, such as cauterization, emetics, leeches, blisters, chlorate of potash, borax and honey, alum, and the expectant method, proceeds to give some clinical details collected during an epidemic at Château-du-Loir in 1844–45. In the first instance, three children in a school were attacked, and they all died without medical assistance, as the relations were ignorant of the severity of the disease until the final symptoms of suffocation supervened. Other children were soon after attacked, and in a few days there were 42 patients, some few being adults. The treatment consisted of repeated cauterization of the throat with the solid nitrate of silver, or with a very strong solution of the salt. The first applications cleared the throat from the pseudo-membranous products, and the last acted upon the denuded tissues and often upon the bleeding tonsils. There were at least 40 cases of cure, without including the slight cases presenting only a few circumscribed patches on the tonsils. The epidemic of Château-du-Loir soon spread to the adjoining commune of Flée. Seven or eight children died after fits of suffocation. They had been cauterized slightly and scarcely once a day, and Dr. Gendron attributes the fatal result to the insufficiency of the cauterization, for in many other cases in the same commune a very energetic application of the remedy was followed by favourable results. The violent efforts of vomiting and expectoration excited by numerous applications of the caustic are supposed to contribute to the cure, by breaking, tearing, and dividing the membranous tissue which tends to develope itself. But Dr. Gendron admits that cauterization does not always succeed, and he considers that in many cases the epidemic poison is so energetic that mere local means are insufficient to counteract the toxæmia. Still he urges the propriety of cauterizing, especially at the outbreak of the epidemic. At the end of December, 1859, another epidemic broke out in the commune of Bruère, two sisters, twins, being first attacked, both of whom died, notwithstanding repeated cauterizations. The father of these girls, a few days afterwards, was attacked with cutaneous diphtheria on a portion of his body which had been accidentally excoriated, and subsequently he suffered from general diphtheria, attended with paralysis. A third child died of the same complaint, but eight others were treated by strong local applications of perchloride of iron, frequently repeated, and they all recovered. Another case was that of a lady who had applied a blister upon an erysipelatous surface, and was seized with cutaneous diphtheria, of which she died. At the same time a child, three years of age, died of diphtheric poisoning; and a young lady, aged nineteen, the sister of the child, was also attacked by the disease, but recovered under the use of cauterizations. In the same commune a great number of cases were successfully treated by the local application of perchloride of iron. It was a curious circumstance that all the patients who happened to have any blistered surfaces were attacked by cutaneous diphtheria.

The conclusions drawn by Dr. Gendron are the following: 1. That, in spite of all the doubts recently expressed upon the subject, the local treatment of diphtheria is, in the present state of our knowledge, the best remedy for this formidable affection, and that M. Bretonneau, in recommending it, and in demonstrating that the disease almost always commences in the tonsils and pharynx, has rendered an invaluable service to medical science. 2. That the perchloride of iron, administered internally, is insufficient, but that as a local remedy it may be advantageously substituted for either nitrate of silver or hydrochloric acid. 3. That local applications will have a greater chance of success in proportion as they are repeatedly employed, and laid upon surfaces deprived of their plastic covering, for that thus they modify the morbid secretion.

XI. *On the Use of Sarsaparilla in Syphilitic Diseases.* By Professor SIGMUND, of Vienna. (Zeitschrift der Gesellschaft der Aerzte zu Wien, January 2nd, 1860.)

Professor Sigmund proposed to himself to examine the properties of sarsaparilla when used alone, and for this purpose he selected the best sarsaparilla root, and administered a portion of a freshly-made and strong decoction to the patients every day, their diet at the same time being carefully regulated. The only remarkable effect of the drug was a moderate excitement of diuresis, and occasionally a slight discharge from the bowels (which might perhaps be attributed to other causes), but no other disturbance of any organ or function could be discovered. The patients were from eighteen to forty years of age, were kept quiet in bed, at a uniform temperature, and were free from scrofulous or other wasting disease. The sarsaparilla was administered both in the primary and secondary forms of syphilitic disease, and the following is an abstract of the results: 1. *In simple recent gonorrhœa:* seven cases exhibited a cure in no case, nor was any one of them made worse; but the symptoms diminished as they would have done under any ordinary expectant treatment. 2. *In chronic* *gleet*, induced by swelling of the prostate gland and consecutive catarrh of the bladder: four cases exhibited no result whatever. 3. *In simple primary syphilitic sores:* nine cases were observed. The local treatment consisted in daily cleansing the sores, cauterization with nitrate of silver, or sulphate of copper, or corrosive sublimate, and dressings with weak solutions of the latter salt. The disappearance of the discharge, and the formation of a clean suppurating surface and gradual cicatrization, followed in six cases in precisely the same manner and at the same period as they would have done in the absence of all internal treatment. 4. *In indurated sores*, the existence of which had not dated beyond five weeks: there were 14 cases, and the local treatment consisted of daily cleansing, and dressings containing white or red precipitate, or iodine with iodide of potassium. There was a slow formation of scars, like flat, hard nodes, while the glands in the vicinity, as well as those at a greater distance, became hard and swollen, and in nine cases during the treatment spots developed themselves on the skin. 5. *In papular syphilitic eruptions, scattered over the skin:* four cases, which had been subjected to no medical treatment, were now treated continuously for thirty days, during which the original papules continued, and others more numerous were produced; here and there one of them shrivelled up and formed little scales upon the cuticle, and larger ones followed after. 6. *In papular syphilitic eruptions, grouped in circles or discs:* four cases had been previously treated with iodide of potassium for five or six weeks, and they were now treated for thirty days without any result. 7. *In secondary ulcers of the skin and in periostitis*, the use of sarsaparilla appeared to produce no effect in addition to that which might be attributed to local treatment with mercury or iodine.

Thus it seemed established that sarsaparilla, used by itself, does not exercise the slightest perceptible influence on the course and termination of syphilitic diseases, and Dr. Sigmund therefore ceased entirely to employ it alone in any form of syphilis.

Cases treated with German drinks, in which sarsaparilla is made to enter as an essential constituent, gave the following results, in the hands of Dr. Sigmund. The preparation employed was Zittmann's decoction, prepared according to the Prussian pharmacopœia.

1. *In secondary syphilis*, the cases which had not been treated at all previously, exhibited no deviation from the ordinary course as long as the decoction alone was employed; upwards of a hundred such cases were observed. More than half of the patients bore the purgative effects very badly, and suffered from constant sleeplessness and obstinate discharge from the intestines, while some actually became emaciated.

2. *In secondary syphilis*, which had been previously treated by mercury or iodine, or both combined, but without success, and in which the cases presented relapses, papular or pustular eruptions, squamous affections, ulcers of the skin and mucous membrane, disease of bones, &c.; in such cases, the use of the decoction alone generally diminished the symptoms, and its continued administration in certain instances effected a cure. In all such cases, copious discharges from the intestines and bladder and abundant perspiration were the immediate results of the treatment, and whenever these results failed to ensue, the cure was not effected. Since sarsaparilla employed alone does not produce the effects just described, the inference is, that the results must be attributed to the other ingredients present in the decoction, and therefore the sarsaparilla was omitted and a decoction prepared from the other constituents, and this latter afforded the same results under the same circumstances, even when the sarsaparilla was quite pure, and not mixed, as is often the case, with bardana, astragalus, inula, &c. The decoction of Zittmann is well known to contain a considerable quantity of antimony and mercury, and the operation of this preparation is accounted for by the presence of these minerals.

The conclusion to be drawn from the above cases is, that the use of sarsaparilla alone in gonorrhœal discharges, and in primary and secondary forms of syphilis, effects no material change, and that the activity of the decoctions which contain sarsaparilla cannot be referred to that root as one of their essential constituents.

XII. *On the Value of Sulphate of Cinchonine in the Treatment of Intermittent Fevers.* By Dr. Moutard-Martin. (L'Union Médicale, March 29th, 1860.)

The object of Dr. Moutard-Martin is to ascertain whether the sulphate of cinchonine may be substituted for sulphate of quinine in the treatment of intermittent fevers, and the question is the more important, because the price of the former is much less than that of the latter, and if it should be found equally efficacious, a great saving of expense would be the result. Twenty-eight cases were observed by Dr. Moutard-Martin with great care, and due precautions were taken to guard against fallacy in the results. He convinced himself, for instance, that the patients did not recover by merely natural means, for he allowed at least three paroxysms to occur under his own observation before he administered the drug. He also tested the purity of the sulphate before using it, and he found generally that it contained about a hundredth part of sulphate of quinine. His conclusions are drawn from 19 cases, of which 13 were completely cured, 2 were improved, and 4 were altogether unaffected. In the 13 cases of cure, the action was immediate in this respect, that on the first paroxysm which followed the use of the cinchonine the disease was modified, but was not always cured at the same time. Twice the fever disappeared immediately after the first dose, six times after the return of a single mitigated paroxysm, twice after two paroxysms, three times after four paroxysms, and once after six paroxysms. Dr. Moutard-Martin considers that when sulphate of cinchonine acts sufficiently, it acts like sulphate of quinine, and cuts short the paroxysm, but at other times its action is insufficient to produce this effect, and it is in vain to increase the dose; for symptoms are caused which render it inexpedient to push its use any further. The sulphate of cinchonine appears therefore to resemble the sulphate of quinine in its action, but its operation differs in its intensity. The precise rank which cinchonine ought to hold cannot be determined until it has been administered with the same frequency as quinine. It may be possibly inferior to the latter as a cure for intermittents, but perhaps superior to it in the treatment of other diseases.

Dr. Moutard-Martin considers, however, that sulphate of cinchonine cannot be substituted for sulphate of quinine in the treatment of intermittents. Accurate observations have proved that the former cures three cases out of four, but the latter cures nineteen out of twenty; the action of quinine is therefore more energetic and certain than that of cinchonine. There would, however, be an advantage in introducing cinchonine into habitual use at the hospitals, for it is unquestionably one of the most energetic agents which have ever been substituted for quinine. Dr. Moutard-Martin's conclusions are the following:—1. The sulphate of cinchonine administered in intermittent fevers, has a decided but variable action. 2. Sometimes its action is rapid, and it cuts short the paroxysms like sulphate of quinine; at other times its action is slow, whatever may be the dose administered, and the paroxysms gradually wear themselves out. 3. The dose of sulphate of cinchonine ought always to be stronger, at least by a third, than that of sulphate of quinine employed in the same conditions. 4. In order to obtain the curative action of sulphate of cinchonine, a dose must be employed, varying, according to the case, from ten to fifteen grains. 5. In this dose it sometimes causes some physiological effects which it would be prudent to repress by discontinuing the drug. 6. The therapeutical operation of the sulphate of cinchonine is not in proportion to its physiological action, for it sometimes cures without the patient's feeling its effects; while in other cases the physiological action is energetic, but the therapeutical action is deficient. 7. The sulphate of cinchonine cannot be substituted for sulphate of quinine in the treatment of the more severe forms of intermittent fevers. 8. The sulphate of cinchonine may become a valuable adjunct to the sulphate of quinine by completing the cure which has been commenced by a dose of sulphate of quinine, and this proceeding would combine safety with economy.

XIII. *On the Power of Iodide of Potassium in expediting Mercurial Salivation.* By Bernard Kelly, M.D., of New York. (American Medical Monthly, March, 1860.)

Dr. Kelly has never failed to produce the specific action of mercury in a remarkably short space of time, by the simultaneous use of large doses of iodide of potassium. This plan is expeditious and quite manageable, involving neither unnecessary labour nor expense; and the salivation induced by this combined action is quite as efficacious as that produced by mercury alone; the ptyalism thus caused is also milder, never producing the horrible fetor and sloughing so characteristic of mercury when used alone. In treating infantile diseases, however, Dr. Kelly thinks that both substances should never be given simultaneously; but the combined treatment is advantageous when the disease is a very severe one, or when the patient is aged or debilitated, or one in whom the depressing effects of mercury are to be guarded against.

XIV. *On a Case of Uterine Polypus treated by Injections of Perchloride of Iron.* By J. N. Graham, M.D., Chicago. (American Medical Monthly, March, 1860.)

Dr. Graham relates a case of uterine polypus, in which, after the usual local and general measures had been adopted without success, he injected the tincture of sesquichloride of iron, diluted with one-third of mucilage of gum arabic. By this measure the polypus was rendered so brittle, and the os uteri was so much dilated, that the new growth was removed by the fingers, without the use of instruments. There was considerable hæmorrhage, but it was soon arrested by cold injections of alum water. The author considers that the iron exercised a beneficial influence in astringing or cauterizing the relaxed mouths of the bleeding vessels, and separating the attachments of the fungus.

XV. *On the Use of Raw Meat as a Remedy.* By F. P. Leverett, M.D. (Charlestown Medical Journal and Review, March, 1860.)

The use of raw meat as a remedy, first recommended by Weisse, of St. Petersburg, has been followed by remarkable success in American practice. In 1855, Dr. Caspar Morris introduced the use of raw beef into the children's ward of the Philadelphia Hospital; and the patients soon took it with readiness, if not avidity, and with great benefit. The mode of administration was to take a fillet of beef, as free from fat as possible, and scraped with a knife, being thus reduced to a pulp; this was generally seasoned with salt, and sometimes with sugar. A teaspoonful of the pulp was first given three or four times a-day, and then gradually augmented as the child's fondness for it increased. The first cases in which the raw meat was given were those of two little children who had been much reduced by a long-neglected intermittent fever, followed by obstinate diarrhœa. Under the use of the raw meat they soon began to improve, and in less than a fortnight they were convalescent. Another case was that of a child, two years old, suffering from hereditary syphilis, and reduced to the most emaciated condition. Raw beef and brandy were administered, and in a week there was a change for the better, so that it was possible to administer iodide of potassium for the constitutional affection; and in two or three months the patient had quite recovered. Raw meat was given not only to children, but also to adults with great benefit. One was a case of a man suffering from chronic diarrhœa, who took the raw meat, and in less than two months he was cured. In 1856 Dr. Leverett administered the raw beef in a number of cases at an hospital in Philadelphia, and often with marked success. He found that it could be rendered palatable to adults, if sprinkled with salt and allspice, and spread on a thin slice of bread, or between two slices as a sandwich. In one case of chronic dyspepsia, with great irritability of the stomach, it was retained when almost everything else was rejected; and in the latter stages of typhoid fever it proved a valuable article of diet. Dr. Leverett thinks that the value of raw meat as a remedy lies in its being highly nutritious, easily digested and assimilated, and capable of being efficaciously administered in a small dose, one or two mouthfuls being enough for a meal.

XVI. *On the Influence of Carbonic-acid Gas in the Cicatrization of Wounds.* (Bulletin Général de Thérapeutique, March 15th, 1860.)

For some years MM. Demarquay and Leconte have conducted a series of researches on the action of gases applied to the living structures. In their first memoir they described the influence exercised by certain gases on the tissues when injected into the areolar tissue or the peritoneum. From these experiments it is shown that oxygen, nitrogen, hydrogen, and carbonic acid so employed are not at all poisonous; that they are all readily absorbed, except nitrogen; and that they do not remain in a state of isolation in the tissues, but combine with the gases of the blood. These facts proving the innocuous character of the gases, have led MM. Demarquay and Leconte to study carefully the action exerted by them in contact with tendons divided by subcutaneous section. The results are that oxygen, placed daily in contact with the divided tendons, sensibly retards their organization, or rather, the reparation of subcutaneous wounds; hydrogen is still more injurious; and nitrogen has no action at all. Carbonic acid, however, differs from the other gases, in facilitating the reparation of divided tendons. This fact being established, it was reasonable to hope that the latter gas would act in the same manner when placed in contact with a wound of the integuments, and that it would hasten considerably the action of cicatrization, if it could be kept for a considerable time in contact with the wound. To attain this end, the authors of these researches have constructed an apparatus of caoutchouc to fit on to limbs affected with wounds, and it is so made as to cover the wounded surfaces, and to admit of being filled with an atmosphere of carbonic-acid gas, which thus bathes the limbs for four or six hours, or even more, without any fatigue to the patients. Many patients suffering from gangrenous ulcers, diphtheritic sores, and other wounds of a foul character, which had resisted other kinds of treatment, recovered with remarkable rapidity when submitted to the prolonged action of carbonic-acid gas.

QUARTERLY REPORT ON PATHOLOGY AND MEDICINE.

By Edward H. Sieveking, M.D.,
Fellow of the Royal College of Physicians, Physician to, and Lecturer on Materia Medica at, St. Mary's Hospital.

I. *Notes relative to Cases of Sun-stroke at Baroda. Compiled from Official Papers in the Director-General's Office, Bombay.* (Trans. Med. Phys. Soc. of Bombay, No. V., New Series.)

A sudden and almost unaccountable mortality from sun-stroke occurred at the end of May and the beginning of June, 1859, in the K battery, stationed at Baroda. Within seven days, ten men out of a strength of 211 died, in spite of all precautions being taken to guard against the extreme heat. The strongest and finest men were those who suffered first, and as the men generally became much depressed in consequence—so much so that many thought themselves struck when there was nothing the matter with them—the company were, at the urgent recommendation of the medical officers, marched out for change. They moved to Dubka, on the banks of the Myhee, within reach of the sea-breeze, and where the soldiers could find plenty of amusement. From their arrival at this place, rapid improvement took place. Nothing could be traced in the diet or barracks to account for this great mortality; nor did the duty appear to be the cause; the temperature was higher on the first day on which a fatal case occurred than on any day previous, being 110° in the shade at 4 p.m. The chief predisposing cause, however, was intemperance; with one exception, all were "hard drinkers," or "free drinkers." Assistant-surgeon Chapple, who reports on the occurrence, states: "I have carefully examined the canteen reports, as far as I had the means of doing so, and I found the quantity consumed daily very high; but on the 29th May, though there were fewer men of effective strength (in consequence of the increase of sick and convalescents), and therefore fewer men to drink the usual ration, the expenditure of arrack was greater than on any day previous, proving that the men resorted to the canteen at that time more frequently than usual."

He continues: "The high temperature acting on men of intemperate habits of course rendered them more liable to suffer from exposure, and to these combined causes, high temperature, exposure, and intemperance, I attribute the mortality. The means adopted to prevent the further progress of the mortality were suspension of drills, parade, and the closure of the canteen, with the exception of the issue of one pint of porter per man daily, and removal to the sea-coast."

Details are given of several of the cases; the fatal issue took place in periods varying from one and a half to twelve and twenty-four hours from the seizure. The treatment adopted consisted in cold affusion to the head, leeches, blistering, purgatives, and stimulants. No uniform lesion was discovered in the autopsies; in fact, in most of the cases all the viscera were perfectly healthy.

II. *Pathology of the Pituitary Body.* By Middleton Michel, M.D. (Charleston Medical Journal, March, 1860.)

This paper is founded upon a case of some interest, with reference to the doctrine of the Wenzels, that the pituitary body is always diseased in epilepsy, It proves at all events that the pituitary body may be involved in disorganizing disease without producing symptoms of a convulsive character. The following are the chief points of the case:

A negro man, aged thirty-five, who had always enjoyed good health, came under Dr. Michel's care in March, 1855, when he was suffering from severe headache of an intermittent character, with amblyopia; his appearance and gait being those of an amaurotic individual. He walked erect, slowly, and cautiously, the eyes largely opened, and the pupils almost immovable, but he was still capable of dimly discerning large objects. He had first felt some uneasiness about the head three and a half years previously, and soon found himself to be getting amblyopic. Obliged to discontinue his work, his sufferings were occasionally increased by intense pain in the frontal region, accompanied with a sense of fulness about the orbits. The eyes, however, preserved their natural lustre, and but for the amblyopic symptoms, would have attracted no attention. These difficulties continued for some months, when it was perceived that the globes of the eyes had obviously increased in tension, and apparently in size. The general health had undergone no change, and though dejected in spirits, the man seemed full of hope when he came under Dr. Michel's personal observation in March. There was ptosis, which gradually increased; chemosis supervened, with febrile symptoms; the head symptoms increased, the patient became temporarily insomnious and delirious. At the same time a swelling made its appearance in the right temporal region, at first soft and painful, afterwards becoming harder and less sensitive; it raised the aponeurotic layer of the temporal muscle without affecting the colour or texture of the skin; pressure upon it produced neither coma nor convulsions. There were strange sounds in the right ear, attributed to encroachment of the tumour upon the auditory apparatus, while the loss of smell and snuffling respiration also showed that the ethmoid bone was interfered with. Some impairment of the memory was the only change in the intellectual faculties; with a weak pulse, varying from 90–115, and varying exacerbations of the symptoms, he continued till September, 1855, when he was carried off by diarrhœa. The autopsy confirmed the diagnosis of an intra-cranial tumour; it was found occupying the sella turcica, resembling in size, form, colour, and consistence a ripe blue fig; from it a pediculated mass of much larger size extended into the right temporal fossa, unattached to the brain, and forcing its way through the base and right side of the skull. The tumour contained a dark, offensive, grumous substance. The entire centre of the sphenoid, save its lesser wings, a portion of the ethmoid, and the floor of the orbits, were destroyed; the optic nerves were pressed flat and converted into mere threads. The microscopy of the tumour having been postponed till some time after the autopsy, gave no information as to its nature.

III. *On the Difficulties and Advantages of Catheterism of the Air-passages in Diseases of the Chest.* By HORACE GREEN, M.D. (American Medical Monthly, Feb. 1860.)

The injection of strong solutions of nitrate of silver into the bronchi of phthisical subjects and persons labouring under chronic bronchial affections, has for some time been strongly advocated by Dr. Horace Green. He employs a solution of fifteen grains to the ounce, of which he injects a drachm at varying intervals. Four years ago he published an analysis of 106 cases* in which he had employed this method, and encouraged by the success he then had, he has since continued to use it largely. He has so favourable an opinion of the value of injecting the bronchi in the above-named affections, that he would rather relinquish all other therapeutic proceedings than this one. In order to ascertain the powers of endurance of the bronchial mucous membrane, Dr. Green, a short time ago, made some experiments on cats and dogs. The following is a summary of one of these. A catheter was passed into the trachea of a dog weighing fifty pounds, and half an ounce of a solution containing fifteen grains to the ounce was injected. The dog was perfectly well after the operation, and continued so the next day. A second injection of an ounce of a solution containing thirty grains to the ounce was then made; immediately after the operation the dog did not seem inconvenienced, but within two hours moist bronchial and crepitant râles were heard throughout both lungs and during the ensuing night the dog died.

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* American Medical Monthly, March, 1856.

IV. *On the Influence of Valvular Disease of the Heart in promoting Diuresis.* By Dr. August Kuehner. (Archiv für Physiologische Heilkunde, Jahrg. 1859, Heft 4.)

This paper is written to inquire how far the law laid down by Ludwig and Goll, that the secretion of urine is materially modified by the pressure exercised by the blood upon the walls of the vessels, is influenced by pathological conditions. Ludwig showed, and his views have been experimentally confirmed by Goll, that the Malpighian bodies offer considerable resistance to the blood-current, as their vas efferens has a smaller diameter than their vas afferens, or than a section of the entire vascular coil; by this means an arrest of the blood and increased lateral pressure are induced, and a larger quantity of water is therefore forced out. Dr. Kühner, at the suggestion of Professor Bamberger, undertook to inquire into the variations that might occur in the amount of the renal secretion under the influence of valvular disorganization. In these cases the blood contained in the heart is subjected to an irregular distribution, and the tension of the arterial system is necessarily diminished. The amount of blood thrown into the aorta at each systole is reduced, or a certain quantity regurgitates. As a smaller quantity of blood occupies a smaller space, and causes a smaller advance of the column of blood, the tension of the aorta and the propulsive power of the left ventricle are also reduced. Hence the circulation is retarded in the arteries, and the impediment operating backwards on the venous system, a further cause of an arrest of the circulation comes into operation, and the veins become distended.

Dr. Kühner analyses these circumstances from the point of view that he takes up, and then examines a series of cases, to ascertain in how far pathology bears out the theory that is implied. He has not, however, been able to make out any definite relation between the renal secretion and cardiac disease, such as would have been anticipated from the previous remarks. The following are in brief the conclusions he arrives at from a careful observation of the actual phenomena.

"Goll's experiments, which demonstrated the important influence exerted by the hæmostatic pressure upon the secretion of urine, are not confirmed as regards valvular affections. The amount of urine secreted bears the same ratio in valvular diseases as in all other chronic affections. It fluctuates in cases not associated with dropsy within the normal limits, or is moderately diminished. As soon as dropsy accompanies the valvular disease, the urinary secretion is determined by the former in a marked manner, and stands to it in an inverse ratio—i.e., it diminishes as the dropsy increases, and *vice versâ*. As the fatal end of the disease approaches, it sometimes undergoes no change; at times it is much reduced."

V. *A Case of Malformation of the Heart, presenting only Two Cavities.* By Dr. Ch. Bernard. (L'Union Médicale, March 31st, 1860.)

A male infant, twenty-three days old, came under the care of Dr. Bernard, on the 27th of January, 1860, suffering from muguet, but without any pulmonary or cardiac symptoms. The child grew weaker from day to day, and died on the 2nd of February, without having had cyanosis, suffocative or convulsive attacks. The autopsy revealed a well-marked enteritis, malformation of the heart, and extensive softening of the brain. We shall only dwell upon the appearances presented by the heart. Instead of the usual triangular shape, it had an elongated and cylindrical form, so as to resemble the heart of the inferior animals; which resulted from an absence of the right cavities. On opening the organ by its upper wall, only two cavities present themselves; the first is a large wide auricle, without any trace of division into two parts, right and left; it communicates by an oval opening with the ventricle, capable of receiving the point of the little finger, and provided with a healthy mitral valve. The ventricle, from its position, conformation, and relation to the aorta, was evidently the left ventricle. At its upper part, and to the right, there was a muscular ring, with a cavity above, which scarcely admitted the tip of the third finger; it was large enough to contain a small hazel nut, appeared to be a rudimentary right ventricle, and presented no other communication than the one just mentioned. At the top of the ventricle, above this imperfect inter-ventricular septum, the aorta arose, and appeared to present the usual dimensions; there were three sigmoid valves, which completely closed the orifice of the vessel. No mention is made of the other cardiac vessels.

VI. *On Uræmic Affections of the Intestines.* By Professor TREITZ. (Vierteljahrschrift für die Practische Heilkunde, xvi. Jahrg., 1859, Vierter Band.)

This essay is devoted to the consideration of the changes occurring in the intestinal canal, associated with Bright's kidney and uræmia. In some cases the condition of the whole tube, from the cardiac to the anal orifice, is one of chronic blennorrhœa; there is a large quantity of mucus of a grey or yellowish-white colour, coloured with bile, and very tough. The mucous membrane is hypertrophied, and its surface somewhat irregular, owing to the varying quantities of epithelium. The membrane is remarkably anæmic, white or grey, and with black pigment here and there. The scanty fæces are enveloped in a dense layer of mucus. Occasionally the anæmia is not universal, but single segments, or even the whole tract, may occasionally exhibit considerable congestion, so that the membrane then presents a purple or reddish colour, and we then have all the phenomena of chronic intestinal catarrh. The author states that the condition just described is not so frequently met with as hydrorrhœa of the intestine, which exhibits itself in the form of an accumulation of watery fluid, especially in the jejunum, of a yellowish or greenish colour, in which the food is suspended. The coats of the intestine are excessively relaxed, and the mucous membrane is much softened and pulpy. The odour of the contained liquid is pungent and ammoniacal, and this ammoniacal character is brought out still more forcibly by the addition of liquor potassæ. Its causticity is shown by the condition of the mucous membrane, which presents eschars here and there, occupying the most prominent folds of the mucous membrane. In all the cases in which Professor Treitz met with these appearances, there was no other morbid condition to which they could be attributed except advanced Bright's disease of the kidney, and he therefore terms them *uræmic.*

Besides the separation of softened portions of the mucous membrane, the latter at times presents a gangrenous condition; we have before us gangrenous dysentery, which is to be distinguished from dysentery occurring under other circumstances, that the intestinal membranes are in a remarkably passive condition, showing no thickening, tumefaction, injection, or suppuration; perforation may result.

Partial sloughs of the intestine need not necessarily prove fatal; cicatrization may follow, but it would be difficult to distinguish the cicatrices arising in this way, from those resulting from other causes.

Professor Treitz further remarks, that Bright's disease of the kidneys may also be accompanied by dysenteric ulcers of the colon, which he explains thus: the superficial epithelial layer is removed, and if it cannot be replaced with sufficient rapidity the deep layer of the mucous membrane is exposed, inflammation is excited by contact with the irritant liquids, excoriations produced on the prominent folds, and in the process of time exudation and suppuration result, exhibiting all the phenomena of ulcerative dysentery.

Another condition of the intestines which the author has met with in Bright's disease, is what he terms dysenteric maceration (*macerations dysenterie*). He describes it as follows:—Occasionally rather large circular patches are seen in the colon in which the mucous membrane is eroded, so that the submucous areolar tissue or the muscular coat is exposed; the edges of the mucous membrane are well-defined, softened, and neither swollen nor œdematous. The tissues are characterized by anæmia, and the surface is covered with a gelatinous layer of mucus. At times the mucous membrane is entirely destroyed for a space of several inches, and the exposed parts look as if they had been macerated for several days. If the disease has lasted a considerable time, the denuded parts become condensed and cicatrized so as to narrow the intestine more or less. The contents are feculent, thin, pale yellow, and of a pungent odour. This condition may be associated with follicular ulceration, or with a soft, croupy exudation. The author is satisfied that the loss of substance just spoken of is due to softening and solution of the mucous membrane by the ammoniacal contents, and not to ulceration, and he has therefore applied to it the term dysenteric maceration, or macerative dysentery.

The following tabular analysis of 220 cases of genuine uncomplicated Bright's disease, will serve best to show the relative frequency of the various intestinal affections alluded to by our author—

Hydrorrhœa occurred	80 times.
Blennorrhœa and catarrh	62 „
Croupy and ulcerative dysentery	27 „
Follicular ulceration and macerative dysentery	19 „
Sloughs	12 „
Hæmorrhage in the intestine without determinable source	4 „
Normal feculent masses	5 „
Cases in which the state of the intestines was not carefully determined	11 „
Total	220 „

In the concluding remarks on the pathology of the conditions previously spoken of, Professor Treitz lays great stress upon the frequency of the coexistence of general dropsy, especially with the hydrorrhœa, blennorrhœa, and macerative dysentery; in which he met with it respectively in the proportion of 75, 79, and 73 per cent. of the cases.

He concludes that the copious watery diarrhœa accompanying Bright's disease is symptomatic of the general dropsy, and should be treated accordingly; that the more watery the contents of the intestine, the greater will be the dilution of the ammoniacal salts, and the less their influence upon the mucous membrane; hence, he argues, blennorrhœa and maceration of the mucous membrane will prevail in this case, while inflammation and sloughing will follow when there is less water, and the ammoniacal contents in a more concentrated form.

In a second section of the same essay the author seeks for the explanations which physiology may afford for the various phenomena in question, and sums up his conclusions under the following heads—

1. Whenever the urinary secretion is arrested, excrementitious matters, especially urea, accumulate in the blood.
2. An accumulation of the constituents of the urine in the blood also takes place in consequence of the absorption of urine after it has been secreted.
3. Accumulation of urea in the blood is itself an important pathological condition, which probably generates or promotes exudative processes in the most various organs.
4. Urea passes from the blood into all the secretions.
5. It shows itself most frequently in the intestinal secretions.
6. It is there uniformly decomposed by the intestinal fluids into carbonate of ammonia.
7. This salt causes irritation, blennorrhœa, softening, catarrh, sloughing, and dysenteric destruction of the intestinal membranes, and many forms of dysentery originate in this manner.
8. Absorption of the ammonia contained in the intestine causes ammoniacal poisoning of the blood—ammoniæmia.
9. This also results from direct absorption of decomposed ammoniacal urine.
10. The impurity of the blood through these substances only produces serious results when their removal by the normal excretory organs is impeded.

VII. *Leucocythæmia.* By Calvin Ellis, M.D. (Boston Medical and Surgical Journal, Feb. 9th, 1860.)

In a case of diseased lymphatic glands, with enlargement of the heart and spleen, occurring in a man, aged thirty-eight, where a great preponderance of the white corpuscles was found in the blood after death, Dr. White, who analysed the blood, describes a new form of crystal in the following terms:

"The specimen given me for examination was of a dirty, reddish-brown colour, and had a conserve-like density; the upper parts of the coagula being in spots marked by white concretions of the colourless corpuscles. It was very slightly acid, and had a fishy odour, although no decomposition had taken place. On microscopic examination, in addition to the usual appearance of red and colourless corpuscles, numerous minute crystals were noticed, such as I had never seen before. The crystals unfortunately are of the same specific weight, and therefore cannot be isolated for a separate analysis. They are colourless, transparent, and appear to be faintly-marked, elongated, rhombic octohedra, with sharp outlines in profile. In a few instances they are united in pairs, the long axes crossing each other at right angles. Many of them differ from the true type of crystallisation, being extremely elongated, and exhibiting incurved faces, and such irregularities of form as to prove their organic nature. This supposition is fully confirmed by the result of incineration, to which on being submitted no residue was left. In sulphuric and hydrochloric acids they are quickly dissolved. In a solution of caustic potash they are readily soluble, but no ropiness is produced by its addition to the blood, as would be the case if pus were present. In acetic acid they are also soluble, though slowly. In concentrated nitric acid they are completely insoluble, even when heated, and assume a faint yellow hue. In cold and hot water they are alike insoluble." Dr. White proposes to call the substance which forms these crystals, leukosin.

VIII. *Variola and Vaccinia.* By Ephraim Cutler, M.D., Woburn, Mass. (Boston Medical and Surgical Journal, March 15th, 1860.)

This paper contains an account of numerous experiments made by Dr. Cutler to determine the susceptibility of cattle for variolous and vaccine poison taken from the human body. About forty young kine and cattle were inoculated successively by the author with matter taken from a variety of sources. It was introduced either by quill and puncture with lancets, by rubbing the charged points of quills upon crucial abrasions of the hairless cutis, or by introducing, in the form of setons, threads charged with the variolous virus. The part selected for the operation was the vicinity of the vulva. Dr. Cutler did not succeed in obtaining the normal pustule, although more or less inflammation was induced by the proceedings. He then performed a series of experiments in which he vaccinated a number of cattle with the vaccine with which he was in the habit of vaccinating human beings. The success of the various methods employed was as follows: the seton plan failed, the quills generally succeeded, but the plan most uniformly successful consisted in pricking into crucial abrasions of the cuticle with a lancet, portions of a scab dissolved in water until it was of the consistence of thick paste. The pustules formed in the animals were generally large, and matured the eighth or ninth day after vaccination. They varied somewhat in size; in some a characteristic blue colour was observed in and about the pustule, this was especially the case when the seat of vaccination was upon the part of the labium where the skin merges into the mucous membrane. No constitutional symptoms were noticed in the cows.

IX. *On Saturnine Poisoning by Glass Powder.* By J. Ladreit de Lacharrière. (Archives Générales, Décembre, 1859.)

This paper is written to show that lead poisoning of a very severe character may occur from causes not hitherto suspected capable of producing it. The cases, 8 in number, occurred in females engaged in enamelling iron hooks intended to support the telegraphic wires. It was necessary that these hooks should be solid, and bad conductors of electricity; hence they were made of iron and covered with several layers of powdered glass. The following is the process adopted: the hooks are dipped in a solution of gum, and then passed to other workmen, who with sieves cover them with pounded glass; when dry they are exposed to a very high temperature, so as to fuse the glass; a second and third layer are successively added in the same way. The workpeople who shake the sieves work all day long surrounded by clouds of fine glass-dust. The glass is itself prepared by fusing colourless glass with borax, nitre, cobalt, and oxide of iron in certain proportions; a dark-coloured, very friable mass results, which is reduced to a powder with which the hooks are covered. As no lead was contained in the other materials with which the parties worked, it had to be looked for in the glass. According to MM. Pelouze and Frémy, the quantity of minium that enters into the composition of four varieties of glass varies from 32·5 to 53 per cent. Having determined that the glass contained a large quantity of lead, the question that next arose was how the lead became absorbed? The author is of opinion that an explanation is afforded by the fact observed by Pelouze, that finely-powdered glass (crystal) when shaken up for a short time with cold water containing a little acid, yields with sulphuretted hydrogen a black deposit of sulphuret of lead. M. Lacharrière thinks that a similar decomposition takes place in the human body, and that the glass-dust absorbed for many entire days in the organs of digestion and respiration is affected in such a manner as to set at liberty the lead which it contains. The reason why none of the men engaged in the work are attacked appears to be that at the time the article was written, they had only been occupied in dusting over the hooks for four or six weeks; previously their business consisted merely in putting them in the furnaces and handing them to the women. The author felt the more assured that the men would soon manifest symptoms of lead-colic, because he already discovered in them a well-marked blue gingival line.

The number of females attacked appears to have been much larger than those seen by M. Lacharrière, but he has not been able to obtain the exact numbers. He was struck with the great rapidity with which the toxic effects were produced, as well as with the severity of the symptoms. The first that showed themselves were general indisposition, headache, lumbar and epigastric pains; loss of appetite followed, with abundant salivation, retching, sickness, diminution of tactile sensibility, and tremors of the hands. In one, sensibility was almost entirely destroyed; in another, vision became much impaired; in all, the sensibility of the left hand was lost sooner than in the right, which may be attributed to the patients having held the hooks with the former. In all, the hair fell out, and the blue line was well marked.

The following is one of the cases related by the author: Mrs. L., washerwoman, aged twenty-nine, worked at the enamelling for six weeks only; at the end of four, she became ill, and was admitted to the Hôpital Cochin on the 10th of August. She first felt severe pains in the abdomen, epigastrium, and loins; the colic soon increased, and she was seized with vomiting, which made her reject all her food. Her strength diminished rapidly, so that she became unable to stand. She has never been much constipated. On her admission to the hospital, she was pale, her features were much altered; her hair dry, unhealthy-looking and falling out abundantly, the gums swollen, the margins surrounded by a well-marked blue line. She no longer vomited, but there was frequent nausea, and she had a disgust for all food. The abdomen was not drawn in, but extremely painful, especially about the umbilicus; tactile sensibility was much impaired; she was unable to keep her hands open, and they trembled continually. She improved under the use of sulphur baths, fifteen grains of iodide of potassium daily, and repeated purges; and she quitted the hospital on the 10th of October with a very dark line, which had not yet disappeared.

QUARTERLY REPORT ON SURGERY.

By John Chatto, Esq., M.R.C.S.E.

I. *Report on Twenty-four Cases of Tracheotomy, performed in the last Stage of Croup.* By Dr. Fock. (Deutsche Klinik, 1859, Nos. 23, 24, 25.)

In this paper Dr. Fock gives an account of the cases of tracheotomy for croup which have occurred in his practice, and in that of his colleagues, at the Magdeburg Hospital. He observes that, notwithstanding some of the leading practitioners in Germany—such as Langenbeck, Baum, Roser, and Bardleben—resort to the operation, and recommend it in their lectures, it has obtained no general admission into German practice. Of these 24 cases, 10 were successful, the particulars of both these and the unsuccessful cases being exhibited in a tabular form. To this statement Dr. Fock appends some observations.

1. These cases are decidedly in favour of the operation, inasmuch as it was not resorted to until a stage of the disease when death seemed quite inevitable without it, notwithstanding the persevering employment of the various remedies. The saving 10 out of 24 children, apparently absolutely condemned to die, cannot be regarded as other than a great success. It is not desired to

draw from these facts the conclusion that the operation should be resorted to in every desperate case of croup, although it is very difficult to indicate in which of such cases it should be abstained from. It would be a mistake to estimate the degree of danger alone from the amount of dyspnœa; for even when this becomes suffocative during the operation, success may yet be the result. As a general rule, it may be stated that the most favourable prognosis may be delivered in those cases which exhibit themselves from the first as pure croup, and are attended by constantly-increasing paroxysms of dyspnœa; while the contrary is the case when there has been a preliminary bronchial catarrh during several days, and when the child, after seeming to be in a state without any peril, suddenly passes into a condition of actual croup. Either on account of the small quantity of air which enters through the contracted larynx, no bronchial *râle* is produced, or its existence is masked by the laryngeal sounds. The operation is resorted to, and the child in all probability dies with bronchitis and pulmonary œdema. When accompanying the croup, too, a wide-spread bronchitis is observable, the dyspnœa may be more dependent upon the latter than upon the obstruction of the larynx. Pulmonary œdema is probably already present, and death will take place within twenty-four hours after the operation. The difficulty in the performance of auscultation and percussion in these cases is sometimes immense, and may amount to an impossibility. In such instances we can only fall back on the history, and remember that cases of croup in which the disease has become developed with rapidity and violence are more favourable for the operation than those in which it has for some days been preceded by catarrh. In the latter cases the operation should be declined. Again, the prognosis has always been, within the author's experience, of a favourable character when the depressions below the larynx and at the epigastrium become very marked during inspiration. The exaggerated actions of the inspiratory muscles, especially the accessories, augment such depressions much when the lungs are entirely free, and the obstacle is only placed in the larynx; but the smaller amount of such depression is quite remarkable when there is co-existing pneumonia, extensive bronchitis, or pulmonary œdema. In such cases the probabilities of success are too small to warrant our undertaking an operation. Lastly, the constitution should influence our prognosis. It is decidedly more favourable in thin, long-necked children, than in those of an opposite conformation. In determining whether we shall operate in a given case, we have to ascertain whether the after treatment, as regards watchfulness, skilful nursing, &c., can be secured—matters which, however easily provided for in a large town, and in a hospital, may not be attainable in a country district; and yet upon them the result may entirely depend.

2. As to the operation itself, the Reporter enters into the details and the difficulties of its performance, which we need not repeat. He says he always resorts to chloroform, which renders the operation far more easy of performance; and he has never, even in extreme dyspnœa, found any ill effect to result from its employment. At first the dyspnœa is increased by the inhalation, but the narcosis is speedily established, and then the breathing becomes much calmer than before.

II. *On the Treatment of Staphyloma by Ligature, according to Borelli's procedure.* By M. Ancelon. (Bulletin de Thérapeutique, tom. lvii. pp. 441–449.)

During the twenty years in which the author has been engaged in ophthalmological practice he has observed the different varieties of staphyloma to be continually increasing in number; and he cannot but feel astonished at the assertion made by Mackenzie and other writers on diseases of the eye, that this deformity was of more frequent occurrence prior to the employment of vaccination. He is of opinion that the increasing prevalence of scrofula in our own times, and its frequent implication of the eyes, leads to the production of staphyloma more frequently than did variola prior to the introduction of vaccination.

In this paper he speaks highly of the treatment of staphyloma by ligature, as recommended by Borelli at the Brussels Ophthalmological Congress, in 1857. There is less deformity produced than by any other mode of treatment, an artificial eye is more easily adapted, and in some cases a chance is left for the formation of an artificial pupil. Two long, thin insect pins are implanted into the base of the staphyloma, traversing it through and through in the form of an X. A waxed thread is then passed between the plane represented by the pins and the bulb of the eye, and tightened. Next day a fleshy tubercle is all that remains of the deformity, and by the third or fifth day eschar, pins, and ligature have all come away in the dressing, leaving a superficial wound, projecting little beyond the remaining cornea. In a week this has cicatrized. It has been supposed that this procedure must be a very painful one; but in M. Borelli's 15 cases, and in those occurring in the practice of the author and of M. Guépin, of Nantes, it was not found to be so.

III. *Statistics of Amputation.* By PROFESSOR SZYMANOWSKI. (Prag. Vierteljahrschrift, 1860, Band i. p. 61.)

In the course of a paper upon amputation, Professor Szymanowski supplies the following account of the results of the amputations performed at the Dorpat Clinic between the years 1812 and 1857. They were 110 in number, with 25 deaths—viz.,

21	amputations of the	thigh,	with	8 deaths.
42	„	leg	„	8 „
15	„	arm	„	4 „
8	„	fore-arm	„	2 „
9	„	foot	„	3 „
15	„	hand	„	– „
110				25

He contrasts this mortality with the mortality described by Dr. Macleod as occurring during the Crimean war. The proportions being:

	At Dorpat.		In the Crimea.
In amputation of the thigh	38 per cent.	......	62·9 per cent.
„ „ leg	19 „	......	40·2 „
„ „ arm	26 „	......	35·2 „
„ „ fore-arm	25 „	......	23·2 „

With respect to the mortality from amputation of the thigh alone, the following comparison is made:

At the Dorpat Clinic	38	per cent.
After Waterloo	55·7	„
At University College, London	58	„
In the Schleswig-Holstein war	60·2	„
In the Spanish civil war	62	„
In the Crimean war	62·9	„
In the Paris hospitals	75	„
In the Polish war	100	„
In the Mexican war	100	„

IV. *On the Relations of Hernia to Internal Strangulation.* By M. DUCHAUSSOY. (Archives Générales, Feb. and March, 1860.)

During an examination of the details of many hundred cases of internal strangulation, the author of this memoir was induced to investigate the relations which this affection sometimes assumed with respect to hernia. His observations, based upon 39 instances, several of them English, run to some extent; but we can only here notice his chief propositions. Of these he has nine, founded each upon some circumstance of practical import.

1. His first class of cases comprehends those in which, although no hernia was visible at the period of strangulation, this strangulation has still been supposed to have been due to a hernia. This error he shows has been committed by surgeons who, by good right, hold the highest rank; and it is to be remembered that "an internal strangulation, especially if occurring near to the lower end of the intestine, may give rise to the production or the reappearance of a hernia, which may induce error as to the real seat of strangulation."

2. On the other hand, cases have been believed to be internal strangulations, when they have really been examples of external hernia; and this too, in spite of careful examination by an experienced hand. Sub-pubic hernia has been the chief rock here in the way of an accurate diagnosis; small femoral hernia, or such as have taken an unusual direction, also sometimes giving rise to difficulty.

3. In a third class of cases, a deserted sac has formed a tumour in the herniary canal, and given rise to the belief that this was the seat of strangulation.

4. The presence of a hernia during the existence of an internal strangulation of slow progress may for a while give rise to the belief that the strangulation is seated in the hernia, an opinion which is falsified by a continuance of the symptoms in spite of the certain return of the hernia. These cases are not infrequent, but owing to their slower progress the surgeon usually has time to correct his diagnosis. The following rule should be borne in mind:—"Whenever conjoined with very intense symptoms of internal strangulation, the surgeon finds a hernia easily reducible, he should suspect that the strangulation is not due to the latter; and his suspicion becomes converted into a certainty when the symptoms persist, or are only slightly relieved after the reduction of the hernia."

5. A hernia which is habitually returnable may not only cease to be reducible, when the portion of intestine which constitutes it is situated above the internal strangulation; but the changes which then take place in the volume of this hernia may give rise to a consecutive strangulation, if the cause of the occlusion be not discovered by the surgeon, or if it be not in his power to remove it.

6. The irreducibility of a hernia coinciding with an internal strangulation may be quite independent of such strangulation.

7. Thus far we have considered internal strangulation complicated by hernias which were independent of it, or which could be considered as one of the effects of the strangulation. We now have to do with internal occlusions, of which external hernia is the cause. The agent of strangulation may be inherent to the strangulated intestine itself, or it may be furnished by neighbouring organs—as the omentum, the sac, or the peritoneum—either while occupying their primary seat, or dragged thence by the noose of strangulated intestine. These various agents are examined by the author in great detail, but we can only enumerate some of them—viz., stricture caused by the sac, exudation from inflammation of the hernia, the twisting of one end of the intestine around the other, strangulation by a bridle independent of the sac, strangulation by the neck of the sac, &c.

8. An internal hernia the real seat of strangulation, coincides with an external hernia. This internal hernia has been named differently, according to its locality—as intra-iliac, when placed in the iliac fossa; between the peritoneum and the fascia iliaca, retro-cæcal, &c.

9. Internal strangulation arising at a more or less remote period from the date of the operation for hernia, and due to consecutive changes in the intestine itself, the formation of peritoneal bridles, &c.

Of the 39 cases upon which this memoir is based, in 25 the internal strangulation was connected with single inguinal hernia, in 9 with single femoral hernia, in 2 with umbilical hernia, and in 3 with double inguinal. With respect to the situation of the internal strangulation as regarded the hernia, it was in 28 of the cases *on the same side,* and very near the ring by which the hernia made its exit. In 7 cases it was situated a little farther off, but still capable of being reached, or nearly reached, by a prolongation of the incision made in operating upon the hernia. In a single case, the obstruction was on the opposite side of the hernia. Thus, in 35 out of the 39 cases the presence of the hernia was intimately connected with the internal strangulation; so that had the rule prevailed, that in all cases of the simultaneous existence of hernia and internal strangulation the obstacle is to be sought for near the hernia, or at least on the same side, it is evident that in these 35 cases the seat of the obstruction would have been exposed.

V. *Case of Removal of the Patella followed by a good use of the Knee-joint.* By Dr. Knode. (North American Medico-Chirurgical Review, April, 1860, pp. 486.)

The author was consulted in the case of a young man, aged twenty-one, who having injured his knee by falling on the ice, had it tampered with by a quack with the result of producing sloughing of the integuments and death of the patella. The patient had been confined to his bed for two months and a half, and was suffering much from hectic fever. The necrosed patella lay imbedded in the midst of a profuse mass of unhealthy granulations, the synovial membrane being ulcerated to a large extent. The patient's fast-failing strength indicated that he could not much longer sustain the irritation induced by the presence of the diseased patella; and, under the influence of chloroform and ether, it was removed, by grasping it with a strong dissecting forceps, and detaching with the scalpel the remaining attachments, which consisted of portions of the ligamentum patellæ and of the synovial membrane. The inside of the joint was thus fully exposed, the cartilaginous ends of both femur and tibia looking quite healthy. "The wound was closed as nearly as possible by adhesive straps, but the edges could not be entirely approximated. A piece of lint dipped in glycerin was applied over the wound, and the whole knee enveloped in a couple of turns of surgeon's gum-elastic cloth, extending five or six inches above and the same distance below the wound, and fastened by a small roller at each end, to exclude as perfectly as possible the air from the joint—a device which I think contributed much to the satisfactory result obtained." In consequence of the great pain in the joint morphia was given from time to time, and a generous diet, with wine and other stimuli, was ordered. An anchylosed joint was expected as a matter of course, but to the reporter's surprise he met the patient, five months after the operation, walking almost as well as if nothing had ever occurred. "I then examined the joint, and found the depression made by the loss of the patella, and in its stead a ligamentous band seemingly united the two ends of the ligamentum patellæ. He then showed me how well he could walk, run, jump, kick, and, in fact, execute every movement of the joint almost as well as with the sound one, and he further assured me that the strength of the joint, as well as the facility of its movements, were daily increasing." The author is aware of only two other cases of removal of the patella being recorded, one in Gross' 'Surgery,' and the other in Eve's work on surgery.

VI. *On the Employment of Perchloride of Iron in Hospital Gangrene and Pyæmia.* By M. Salleron. (Recueil de Mémoires de Chirurgie Militaire, 3 série, tome ii. pp. 279.)

In this paper M. Salleron, whose account of the condition of the wounded in the French hospitals at Constantinople during the Crimean war we adverted to in our last number (p. 546), gives an account of the really excellent effects which attended the free application of perchloride to the entire surface of the wound in hospital gangrene and pyæmia; always remembering that no local means is of any avail without general treatment occupying the primary consideration. The application is attended with excessive suffering, but the rapid improvement which follows is most remarkable, and that not only with respect to the wound, but the patient's general condition.

VII. *On Secondary Amputations after Gun-shot Injuries of the Bones.* By M. Jules Roux. (Bulletin de l'Académie de Médecine, tome xxv. pp. 558; and Gazette Médicale, 1860, Nos. 17, 18, 19, 20.)

M. Roux, as chief surgeon of the St. Maudrier Hospital at Toulon, has had under his supervision 2000 wounded soldiers brought there during and after the Italian war. The want of success which attended the secondary amputations after gun-shot wounds, and which was chiefly due to *osteo-myelitis* having become established prior to the operation being undertaken, induced M. Roux to substitute disarticulation for amputation or resection in contiguity. In 22 severe cases in which he performed disarticulation (4 coxo-femoral, 13 scapulo-humeral, 1 femoro-tibial, 3 tibio-tarsal, and 1 metacarpo-phalangeal) the patients all did well. The following are his conclusions—1. That osteo-myelitis is inevitable after gun-shot wounds of the bones, but it is usually cured. 2. It ordinarily invades the entire bone more or less promptly. 3. Secondary amputation or resection made in the continuity of the injured bone too frequently only removes a portion of the inflamed bone. 4. Such partial and incomplete operations aggravate the disease and hasten death; and they are probably the principal cause of failure of secondary amputation performed in the continuity of bones directly injured by traumatic lesions, and even in some cases by organic lesions. 5. That when an operation becomes indispensable after six months or even a year, we should, in the majority of cases, if not in all, perform disarticulation in preference to resection or amputation in contiguity.

Upon this paper being read at the Académie de Médecine a discussion arose. M. Legouest stated as the result of his observations amongst the wounded in the Crimea, that M. Roux had laid down this prevalence of a generalized osteomyelitis too absolutely. In this view M. Larrey also concurred, while he thought that the proposition to substitute disarticulation for amputation requires to be received with great caution. Already, indeed, it had been partially carried out in the Crimea, without exhibiting its marked superiority. Thus, in 33 amputations of the elbow there had been 28 deaths, and in 31 disarticulations 24 deaths. Of 68 patients upon whom the operation of disarticulation of the knee had been performed, 62 died. In this last operation, M. Velpeau had met with 13 successful cases out of 14, showing how variable may be the results of operative surgery. M. Robert observed, that if we were only to perform amputation of a limb when the medulla of the bones was in a sound state, the operation would scarcely ever have to be executed. He admired the absolutely marvellous success of M. Roux's disarticulation, so marvellous, indeed, that its repetition is scarcely to be looked for; in fact, these cases have not only been exempted from danger on the score of the bone, but they have escaped the other causes of death due to erysipelas, diffuse phlegmon, hæmorrhage, hospital gangrene, and purulent infection! Moreover, three out of six amputations performed by M. Roux upon the bone above that which was injured (as the humerus for an injury of the fore-arm), proved fatal without any osteo-myelitis supervening. Such discordant results seem to show that in the group of 20 successful disarticulations, M. Roux had to do with one of those lucky series of cases which now and then fall to the lot of all surgeons, while in the 3 deaths in the 6 cases of amputation we see pretty nearly the results of ordinary practice. M. Jobert denied the inevitable occurrence of osteo-myelitis after gun-shot injury; and he believes that the operation of disarticulation is rarely admissible for large bones, such as the femur.

VIII. *On Amputation at the Hip-joint.* By M. JULES ROUX. (Gazette Hebdomadaire, 1860, Nos. 18, 19.)

In this paper, M. Jules Roux gives an account of six amputations at the hip-joint which have been recently performed at Toulon, four of these being followed by success. He also refers to six other cases which have occurred to other officers of the French marine, making in all 12 cases, with 7 deaths and 5 recoveries. Of these, 5 were immediate or primary (some hours or days after the accident), and all fatal; 4 mediate or secondary (several months after the accident or the disease), 3 recovering and 1 dying; and 3 ulterior or consecutive (one or more years after the accident or disease), 2 recovering, and 1 dying.

In the latter part of his paper, M. Roux adduces the recent evidence of the French military surgeons, in proof of the almost invariable fatality of immediate hip-joint amputations, and the frequent triumphs of conservative surgery in gun-shot injuries of the upper third of the femur. Indeed, he gives a list of 21 cases of this injury examined at his own hospital at Toulon since the Italian war, in all of which consolidation of the fracture had taken place. Not one of these men would have survived had primary disarticulation of the femur been performed; and in only one instance of the number, six months after the occurrence of the injuries, had secondary hip-joint amputation become necessary. With respect to gun-shot fractures of the lower two-thirds of the femur, in spite of cases of cure without operation, all statistics prove that amputation is more successful than abstaining from it. The general conclusions are—1. That gun-shot fracture of the upper third of the femur is an exception to the law which requires amputation, after all gun-shot injuries of this bone. 2. That several months after gun-shot wound of the femur, when the necessity for an operation has become obvious, amputation at the hip-joint should be preferred to that of contiguity, whatever portion of the bone may have been fractured. The longer the operation can be safely delayed, the greater are the chances of recovery.

IX. *On the Treatment of Hæmorrhoids.* By MM. NÉLATON and HEYFELDER. (Gazette des Hôpitaux, 1860, No. 23.)

In a recent clinical lecture, M. Nélaton made the following remarks:—"I was some time since a great partisan of the actual cautery in hæmorrhoids, at least since it could be employed under conditions formerly impossible. In fact, nothing can be more painful than its application. I have seen cauterization employed many times by Dupuytren, who first excised the tumour and then cauterized; but so terrible were the sufferings of the patients, that I could scarcely have made up my mind to have recourse to it, had not the means of preventing pain by chloroform been discovered. I have since then frequently had recourse to cauterization with the best results; and if I do not employ it now it is because we have at our disposition another operative procedure, which is just as good, and which is not painful either during or after its application. I mean *écrasement linéaire*. It is usually unattended with hæmorrhage, and when, as is sometimes the case, there is a certain amount of bleeding, this may at once be arrested by means of a powerful hæmostatic, the perchloride of iron. The union of these two means, then, constitutes an excellent method for the ablation of hæmorrhoids.

"One word about ligatures. All surgeons at the end of last century and the beginning of the present were very fearful of applying them, owing to an instance of fatal hæmorrhage which occurred after the application of the ligature by J. L. Petit. I believe I am right in affirming, guided by the cases related by Amussat, and by those which have occurred in my own practice, that these surgeons entertained the most erroneous notions concerning the results of the ligature employed for hæmorrhoids. It is an excellent operation, by means of which patients may be cured in eight or ten days without any accident; and indeed I may place it on the same line with *écrasement linéaire*. The latter has, however, the indubitable advantage of causing the fall of the tumour within a few minutes, although perhaps it offers somewhat less security against hæmorrhage.

"There is one thing to be well borne in mind—viz., that all these operations practised in the vicinity of the anus, however simple they may be in appearance, may terminate in a fatal manner. This is a powerful motive for insisting as long as possible on palliative treatment, only performing an operation as a last resort. Quite recently, one of our leading surgeons applied a small portion of Vienna caustic to a hæmorrhoidal tumour, and the patient was dead next day; while in another case, an incision made into a fistula scarcely a centimetre in length, was followed in a few days by fatal purulent infection. I was myself consulted some years since by a man who, having acquired great wealth, complained bitterly of not being able to enjoy it in consequence of a hæmorrhoidal tumour. I advised him to bear with it, but some time after abundant hæmorrhage having come on, he entreated its removal. He manifested all the signs of complete anæmia. He was put under the influence of chloroform, and the actual cautery was employed. He did not suffer during the operation, but scarcely had he recovered consciousness when he complained exceedingly. I appeased the pain and all seemed doing well, when on the sixteenth day violent shivering ushered in purulent infection, and he died. The conclusion to be drawn from all this is, that you should never operate except when you cannot possibly avoid doing so, since when you least suspect it you may meet with sinister events similar to those just adverted to.

"One more word with respect to *écrasement linéaire*. This operation has during some time been frequently resorted to; and it is for this description of tumour it is perhaps best adapted. But I ought to inform you that in most cases the operation is badly executed. For a short time after its performance the patients are delighted, and the surgeon believes that he has attained a splendid result; but in the course of a few months the cicatricial tissue contracts, and the patients suffer from an anal stricture. During about a twelvemonth I have had a great number of patients, who have come to me in order to undergo an operation for the relief of this unfortunate consequence of removal of hæmorrhoidal tumours—the stricture sometimes scarcely admitting the passage of a quill. It has arisen because not only the mucous projection which alone constitutes the disease has been removed, but also a more or less considerable portion of the skin of the orifice of the anus."

[Professor Heyfelder, of St. Petersburg, commenting upon the above article (Deutsche Klinik, No. 20), adds some corroborative instances of fatal results speedily following apparently trifling operations in the anal region. He is inclined to regard such cases as examples of irritation of the nervous system, somewhat analogous in nature to the *delirium nervosum* or *traumaticum* met with after injuries; and this the more so, as such excitement is often manifested in persons suffering from hæmorrhoids, owing doubtless to some extent to their want of rest.]

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D., F.R.C.P.

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I. The Unimpregnated State.

1. *On the Seat of the so-called Uterine-rush in Abdominal Tumours.* By Professor Pernice. (Monatsschr. für Geburtsk., March, 1860.)
2. *Complete Inversion of the Uterus cured after Six Years' Duration.* By Bockenthal. (Deutsche Klinik, No. 52, 1859.)
3. *Sudden Death from Bursting of an Ovarian Abscess.* By Professor Faye. (Norsk Magaz., 1859; and Schmidt's Jahrb., No. 5, 1860.)
4. *The Anomalies of the Corpus Luteum.* By Rokitansky.

1. Professor Pernice has availed himself of an opportunity of determining by careful examination the seat of the so-called uterine-rush heard in certain cases of abdominal tumour. Veit and Martin had investigated this question. The latter author fixed the origin of the sound in the vessels of the pelvis or in the aorta, as the result of compression. Dr. Pernice maintains that pressure is not always concerned, since the rush is heard in the case of small tumours. He concludes by a process of eliminative reasoning, that the source of the sound must be in the vessels of the tumour itself. The case he relies upon is that of a woman, aged thirty-four, who having suffered some months in 1856 from difficulty in micturition and increasing enlargement of the abdomen, was at first thought to be pregnant. She suffered afterwards from metrorrhagia; and in 1857 and 1859 had two apoplectic fits. A tumour was felt rising above the symphysis; no fluctuation was detected in it. On auscultation the rush was heard on both sides of the linea alba, becoming more intense in the groin, and increasing with pressure by the stethoscope. Close behind the symphysis a large artery was felt pulsating. Tracing this along its serpentine course, a distinct whirr, increasing with the systole, was felt in it. The spot where this sensation was perceived by the finger corresponded exactly with the source of the sound externally. When the artery was compressed, the sound was arrested, and returned on removing the pressure. The rush was thus clearly fixed in the arteries of the tumour. The author points out, that in considering the question of tapping abdominal tumours, we must be careful to avoid puncturing near the spot where the rush is most distinct, in order to avoid wounding the vessels from whence the sound proceeds.

2. Dr. Bockenthal relates a case of complete inversion of the uterus of six years' standing, which was cured by the use of Braun's colpeurynter, after the method successfully employed by Dr. Tyler Smith. The patient, aged twenty-five, had been delivered by forceps. Scarcely a day passed since that event

without loss of blood. The patient was reduced to an extreme state of anæmia. Manual attempts at re-position having failed, the caoutchouc tampon was introduced into the vagina and inflated. This was removed daily, to permit examination. No great difference was observed during the first five days; but on the next day, the patient having felt some nipping pains in the abdomen, examination proved that the inverted uterus had disappeared; the os was large enough to admit nearly three fingers to pass. The hæmorrhage ceased, the uterus returned to its normal size. We take the opportunity of recording another equally successful application of Dr. Tyler Smith's plan, contributed by Dr. Charles West.* These, with the original case of Dr. Tyler Smith, published in the 'Medico-Chirurgical Transactions,' 1858, make three examples hitherto reported of this method of curing a displacement which it has frequently been thought necessary to treat by the extirpation of the organ.

3. Professor Faye relates an interesting case of sudden death from the bursting of an ovarian abscess. A feeble woman, aged twenty-nine, suffered much from vomiting in her first pregnancy. Later, she had convulsive fits, and a fixed pain settled in the right side of the abdomen. She was delivered under chloroform by forceps of a living child. In the following night she had pains, which the midwife took for after-pains. Next day these pains persisted, with slight remissions, and with bearing down. The abdomen was tender, the intestines distended with air. Pulse 128, small; face white; expression prostrated; breath short; sighing; sleeplessness. On the day following she died, fifty-three hours after delivery. A thin, purulent, sanguineous exudation filled the Douglasian space. The right ovary had burst, and the remains were changed to a pulpy detritus. The left ovary was hypertrophied and œdematous. The cortical substance of the kidneys was degenerated. There were small blood-extravasations under the serous membranes of the right kidney, of the liver, and pleura.

4. The following are the anomalies and degenerations of the corpus luteum, according to Rokitansky:

1. *Dendritic excrescence of the corpus luteum outwards through the fissure of the Graafian follicle.*—In one case there grew out of the interior of a fresh corpus luteum, through the fissure, a villous dendritic, soft, yellowish-red vascular excrescence. In a second case there was seated on the extremity of the free border of the right ovarium an excrescence on a stem, consisting of large and small lentil-seed-like bodies, surrounded by smaller, but thick, fibrous, papillary growths. At the basis no trace of corpus luteum could be discovered; but it was seen that the excrescence came from the interior of the ovarium. The patient had during a protracted illness never menstruated, but had borne a child; and it is highly probable that the ovarial excrescence proceeded from a corpus luteum, and that this persisted.

2. *Doubling of the corpus luteum.*—In one case, a corpus luteum was found in the left ovary, which formed a distinct layer from another internal to it and much thinner. Between the two layers was a dark-red coagulum. This could only be explained by supposing that soon after the formation of the corpus luteum a new hæmorrhage from the wall of the follicle took place, that the extravasation detached the corpus luteum, driving it inwards; and that hereupon a second corpus luteum was formed upon the wall of the follicle. Moreover, apparently double corpora lutea often occur.

To the more important degenerations of the corpus luteum belong—

1. *Cystic degeneration.*—There are often found cysts of the size of a walnut

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* Medical Times and Gazette, Oct. 1859.

and larger in persons who have been pregnant, whose walls are sometimes loose, sometimes attached. The colour is often dirty-white, the interior rough, and then is easily recognised by stretching the thinned and expanded layer of the corpus luteum. Rokitansky has even seen on one spot of the cyst-wall an opening which he takes to be the original fissure. At times the cyst communicates with the canal of the Fallopian tube.

2. *Degeneration to a fibrous tumour.*—In one case there was found in the left ovary, enclosed in a plainly membranous case, a long, roundish elastic mass the size of a nut. It was probably a fibrous tumour formed out of a corpus luteum. In another case the tumour was larger than a walnut. These tumours are to be distinguished from the fibrous tumours developed from the ovary.

3. *Degeneration to carcinoma.*—In one case a tumour, the size of a child's head, took the place of the left ovary, which proved to be a cancerous degeneration.

II. PREGNANCY.

Study on the Slow Poisoning by Preparations of Lead, and of its Influence on the product of Conception. By CONSTANTIN PAUL. (Arch. Gén. de Méd., May, 1860.)

M. Paul, an *interne* of the Paris hospitals, has drawn up a valuable memoir on the effects of lead-poisoning upon the product of conception. We will relate one of his observations as an example, and present a summary of his researches. In February, 1859, a woman entered the Necker Hospital, who had been for eight years working as a polisher of printing type. She was suffering from metrorrhagia, and had an evident saturnine cachexia. She had enjoyed good health, and had been delivered of three children, happily before taking to the occupation of polisher. Since then her health had been much shattered by lead-diseases. Three months after entering upon this trade she had a first attack of colic, and four years later another. At this time she became pregnant, and bore a dead child. Three years later still, she bore a child which died at the age of five months. She had eight pregnancies all terminating in abortion at two or three months, attended by excessive metrorrhagia. She recovered in M. Bouley's wards under tonic and restorative treatment.

This case led M. Paul to extended inquiries in the type-foundries and elsewhere. He found that those women almost alone who handle the type are affected by saturnine diseases. In a first series of observations, he found that 4 women had had 15 ascertained pregnancies—of these, 10 ended in abortion, 2 in premature labour, 1 in still-birth, and 1 child died within twenty-four hours.

In a second series of cases, 5 women had borne an aggregate of 9 children at term before exposing themselves to lead, and had had no abortion or other accident of pregnancy. Since exposure to lead they had 36 pregnancies; of these, 26 ended in abortion at from two to six months; 1 in premature labour; 2 in still-birth; 5 children died, 4 of which within the first year; and 2 children were living, 1 being puny and ailing, the other only three years old.

In a third order, a woman had during her employment in a type-foundry five pregnancies, all ending in abortion. She quitted the business and bore a healthy child.

In a fourth order, is the case of a woman who, having left the trade for two periods, bore during these intervals of freedom two healthy children; returning to the trade had two abortions.

In a fifth series M. Paul shows that the same disastrous influence is felt when the fathers handle lead. In 7 cases, every woman had an abortion; of 32 pregnancies occurring during the husbands' exposure to lead, 12 children were born prematurely. Of 20 living children, 8 died in the first year, 4 in the second, 5 in the third, 1 after the third year, 2 remained living.

In a sixth series the author shows that where the lead affection was less marked there was a corresponding diminution of the injurious effect upon the product of conception.

M. Paul has not neglected to check these results by comparing them with the history of the general population. The general official vital statistics are not in our opinion entitled to unreserved confidence as an element in a scientific pathological inquiry; but there can be little hesitation in admitting that pregnancy, under ordinary circumstances, is much less frequently abortive than M. Paul has so clearly ascertained it to be amongst the population working in lead.

III. LABOUR.

1. *The Proceedings of the Lying-in Institution and Polyclinic of the University of Halle, during the year* 1858. By Professor HOHL. (Monatsschr. f. Geburtsk., February, 1860.)
2. *Report of the Leipsig Lying-in Hospital.* (Monatsschr. f. Geburtsk., March, 1860.)
3. *Report of the Vienna Lying-in Institution for* 1857. (Monatsschr. f. Geburtsk., April, 1860.)
4. *A New Pelvimeter.* By GEORGE D. KING, M.D. (Amer. Med. Monthly, Feb., 1860.)
5. *Sudden Death after Natural Labour and Use of Chloroform.* By Professor FAYE. (Norsk Magaz., 1859; and Schmidt's Jahrb., No. 5, 1860.)

1. There is perhaps no method by which we can acquire a clearer appreciation of the general character and success of the obstetric art, than by presenting a summary of the clinical history of public institutions in different countries. We take an opportunity of extracting the leading facts of three German lying-in institutions during recent years.

The first relates to the history of the Halle Lying-in Hospital during 1858, as recorded by Prof. Hohl:—163 deliveries took place, 3 mothers died; the forceps was employed twenty-eight times. We are informed that of 53 cases treated in the Polyclinic, only 11 ran a natural course; that the forceps was applied 12 times on account of defective uterine power, 10 times on account of mal-presentation of the head, once on account of narrow pelvis, once for descent of umbilical cord with the head, twice when the head was last born on account of mal-position. Of these 53 cases no less than 4 shoulder presentations required turning. A very unfavourable view of parturient nature in Germany!

2. We also have a report by Dr. Credé for three years, ending October, 1858, of the Lying-in School of Leipsic:—594 deliveries took place, 20 mothers died, or 1 in 30. The forceps was used 56 times, or in 1 case in 11. Of the forceps cases 4 died; 5 arm-presentations, and 1 head presentation called for six versions. Artificial lessening of the child was performed once. In 14 cases peritonitis occurred.

In the Polyclinic during ten years, ending September, 1859, 1203 deliveries took place; 891 women were enabled to complete delivery unaided, 362 required various operations. The forceps was applied 188 times, or in 1 case out of every 6! Turning was resorted to 55 times; perforation 7 times; cephalotripsy 7 times; the Cæsarean section once in a living woman, twice in the dead subject; 13 mothers, or 1 in 91, died. Among the remarkable facts we find it recorded, that contraction of the pelvis was made out 138 times; of these cases, there were 2 of Naegele's oblique pelvis, 11 funnel-shaped pelves, 5 irregularly contracted, two pelves with exostosis, and 109 rhachitic pelves.

3. The Vienna Lying-in Institution is divided into three departments In the first, the Obstetric Clinique for Physicians, there took place 4220 deliveries, including 950 street-births as they are called, we presume from labour being completed on the road to the hospital. There were 19 face-presentations, 113 pelvic presentations, 18 cross presentations, 52 contractions of pelvis, 9 cases of convulsions. There were 277 cases of puerperal fever, and of these 124 died. This is probably not a complete account of the mortality, for 18 cases of puerperal fever were transferred, and also 136 other patients affected with syphilis, tuberculosis, &c.

The forceps was employed in 74 cases; turning by head was resorted to 3 times, by feet 23 times, the Cæsarean section once, craniotomy and cephalotripsy 7 times.

In the second department, the Obstetric Clinique for Midwives, there were 3795 deliveries, including 860 street-births. Amongst these, there were 27 face presentations, 65 breech presentations, 52 cross presentations, 2 cases of spontaneous rupture of the uterus.

The operations were—12 times the enlargement by incisions of the vulva, 39 versions by feet, 21 versions by head, 43 applications of forceps, 5 perforations, 1 Cæsarean section on the dead subject.

182 women suffered from fever, of these 74 died; and 9 died of other causes.

In the third, a supplementary department, there were 343 labours, including 2 street births. These required 3 versions by the feet, 15 forceps operations, and 4 perforations; 17 women had fever, but the mortality is not stated.

[It will be remarked that the practice of removing patients suffering from puerperal diseases to other wards, prevents our attaining a complete view of the mortality attending the labours in this institution. But a mortality of 1 in 34 from puerperal fever alone in the first department, of 1 in 51 in the second, is sufficient to convey an unfavourable idea of hospital midwifery. With regard to the frequency of operative interferences, we note that in the two chief divisions the forceps was employed once in every 70 cases—a considerable contrast between the 17 per cent. of Professor Hohl and Dr. Credé.

We must infer that a considerable proportional excess of bad cases are attracted to the cliniques of Halle and Leipsic. It is remarkable that in the Leipsic hospital 1 woman out of 9 should have had contraction of the pelvis. We believe that there is a relation between the frequency of contraction of the pelvis and cross-births Tested by this law, we find that in Vienna the cross-births were 1 in 114; in Leipsic, 1 in 23. This would certainly favour the conclusion, that a larger proportion of contracted pelves were admitted at Leipsic. This circumstance will to some extent explain the frequency of operative interference at Leipsic. But making full allowance for this, the English reader will be surprised to observe what a large amount of operative experience our German brethren derive from hospitals admitting less than two hundred patients in a year.—REPORTER.]

4. The pelvimeter contrived by Dr. King, of Washington, is ingenious, and promises to be more effective than any hitherto proposed. It consists of a cylindrical female syringe, through the end of which two diverging steel prongs with knobbed ends protrude, like the horns of a snail. These are connected with the piston; the stem of the piston near the handle is marked off in half inches, so as to indicate the extent to which the diverging horns are

protruded. The instrument has been used by Professor Fordyce Barker, who is reported to speak well of it.

5. Professor Faye relates a case in which death followed the use of chloroform in natural labour. A primipara, aged thirty-five, came to hospital after the escape of the liquor amnii. She had been sickly in childhood; had menstruated freely from her sixteenth year; and had had an attack of hæmatemesis in her thirtieth year. The pains were weak, and opened the os uteri very gradually. Later, the pains became stronger, and at the same time very painful; on this account chloroform was given, but not to the extent of producing loss of consciousness. Since, notwithstanding the stronger pains, the head did not come down, the forceps was applied, and whilst the extraction was effected, loss of consciousness for a very short time took place. The child, a girl, weighed eight pounds and a quarter. The mother recovered complete consciousness, then slept an hour, and continued sleepy afterwards. At 4 A.M. next morning she complained of light shivering, with headache, followed by heat. Abdomen free from pain, soft; pulse 120. She slept in the following hours, apparently very deeply, but was easily awakened. Three hours later her breathing suddenly became difficult and groaning, the face cyanotic, pupils contracted. The second sound of the heart only audible. No convulsions, no pains. The urine contained in light degree albumen. Venæsection to eight ounces; the blood flowed very slowly; wet cloths to the head; leeches behind the ears; sinapisms to the thighs and region of the heart; vinegar enemata. Before noon the patient was quite conscious; answered correctly; breathing not oppressed; but pulse was not to be felt. At noon she died, seventeen hours after delivery. Autopsy twenty-two hours post-mortem. In the skull nothing abnormal; no congestion. Numerous adhesions of pleura. No coagula in pulmonary arteries; lungs quite normal. A pair of bronchial glands were swollen, and filled with a tubercular mass. Heart flaccid, valves sound; in the right ventricle two small soft dark coagula. Endocardium smooth, tinged with blood. Uterus contracted, normal. Stomach and intestines normal; no exudation in peritoneal cavity. In the left ovary a large corpus luteum. Liver of natural size. Under the omental investment, in the convex border, were several blood extravasations; the substance had a granular aspect. In the veins of the liver there was fluid blood. Spleen normal; kidneys of normal size; slight extravasations in capillary form under the tunica propria; the cortical substance granular, yellowish grey. One labium pudendi was distended with a sanguineous effusion; there was also some extravasation along the left wall of the vagina. The pelvis was normal.

[How is this death to be explained? Did the patient die from the shock of labour? If so, it must be admitted that chloroform cannot protect the nervous system against shock. Did she die of the secondary effects of chloroform-narcosis? She seems to have been a person of feeble organization, and perhaps a specially unfavourable subject for anæsthesia.—REP.]

IV. PUERPERAL STATE.

Case of Phlebothrombosis in a Newly-delivered Woman. By J. BAART DE LA FAILLE, d. j. in Groningen. (Nederl. Tijdschr., 1859; and Schmidt's Jahrb., No. 9, 1859.)

Dr. de la Faille's case of phlebothrombosis is of interest as being verified by dissection. A healthy woman, aged thirty-six, was delivered on the 18th of August, 1858, of her ninth child. The puerperal week passed favourably, and the milk-secretion was copious. On the 24th of August, the left extremity was very painful; a white, œdematous swelling of the calf, without increase of heat or fever, followed. On the 3rd of September, she had the third attack of a violent quotidian. The leg was painful to move, but free from swelling. The ague gave way to quinine. On the 6th, the right leg was seized. Lochia still flowing, and milk abundant. On the 9th there was fever, pains in the umbilical region, and diarrhœa, but no distension of belly; bled to eight ounces. On the 17th, the diarrhœa had ceased, the fever persisted. She died on the 6th of October.

Autopsy.—There were a few pseudo-polypi in the left heart; liver somewhat enlarged and hyperæmic; kidneys hyperæmic in the cortical substance; the inferior vena cava collapsed, yellowish, not thickened. The uterine venous plexuses and the plexus pampiniform contained a thin coagulated blood, the remaining uterine organs being in natural condition. The common iliac, the hypogastric and crural veins, as far as they were traced, were filled with black coagulated blood interwoven with fibres. The inferior cava, as high as the first lumbar vertebra, was in the same state. The veins showed no mark of change or suppuration.

V. THE FŒTUS.

1. *Note on the Occlusion and Ossification of the Fontanelles.* By Dr. HENRI ROGER. (L'Union Méd., Nov., 1859.)
2. *On the Question of the Existence of an Intra-uterine Emphysema of the Lungs.* By Professor HECKER. (Virchow's Arch., 1859.)

1. Dr. Henri Roger, physician to the Children's Hospital at Paris, has made the period of the closure of the fontanelles the subject of accurate investigation. He says that, from researches on auscultation of the head, he is satisfied that the cephalic souffle is only perceived whilst there is hitherto no bony obstacle interposed between the ear and the brain; and that it was during these researches that he was led to observe the period of bony closure of the skull. On nearly 300 infants, the fontanelles were never found closed before the age of fifteen months, and never open after the age of three years.

2. Professor Hecker relates a case of very great importance in reference to the medico-legal questions of live or still-birth. During his residence at Marburg he observed the following circumstances:—A primipara, aged twenty-two, was in labour at 3 A.M. of the 7th of March; having suffered light contractions for two days previously. The conjugate diameter was defective by an inch. The liquor amnii escaped at eleven A.M., the os uteri being now partially open. The pains were very inadequate, and at this time the fœtal heart, which had been hitherto plainly audible in the left side of the uterus, could no longer be heard. This was the state of things at four A.M. of the 8th, when the labour began to proceed rapidly, the child being born without assistance at five o'clock. It was born showing no trace of motion of the head, or of breathing-movement; no efforts at resuscitation availed, it was quite dead. The body was examined six hours afterwards. It weighed seven pounds. There was no trace of putrefaction. The lungs were of large circumference, filling the chest, partly covering the pericardium; they were brighter than usual, grey-red, and felt spongy. They floated freely in water; they were extensively emphysematous.

THERAPEUTICAL RECORD.

On the Employment of Uva Ursi in certain Cases of extremely Slow Labours.[*]—Dr. A. Gauchet has proposed and employed the *uva ursi* in certain cases of tedious labours which are usually treated by ergot of rye. He calls attention to the dangerous consequences which sometimes follow the employment of the latter drug, and thinks that the *uva ursi* will be found equally useful, and at the same time less violent in its operation. He relates a case of tedious labour in which he administered *uva ursi*, four drachms of the leaves being infused in a pint of water, and a cupful of the infusion being given every half-hour. The effect of the medicine was to increase the force and frequency of the uterine contractions, and the labour terminated a few hours after the first dose had been given. Dr. Gauchet gives another case of imperfect and irregular contraction of the uterus after labour, in which case the *uva ursi* seems to have had the effect of causing regular contraction of the organ, and the patient recovered without any bad symptom. Dr. Gauchet has also tried this remedy in nine cases of tedious labour, all of which terminated successfully, and he therefore believes that this new plan deserves the attention of practitioners.

On the Employment of Arsenious Acid in Apoplectic Congestion.[†]—Dr. Lamare-Picquot, chief physician of the hospital at Honfleur, has proposed the employment of arsenious acid in those forms of cerebral congestion which often terminate in apoplectic seizures. He was induced to recommend this treatment from the beneficial effects which he experienced himself from its adoption. He states that he suffered for more than three years with symptoms indicative of an approaching attack of apoplexy, but that by the treatment alluded to, continued for nearly nine months, he entirely recovered. His health was restored in 1850, and from that time until the end of 1855 he took no arsenious acid; he ate and drank as usual, and enjoyed excellent health, although he had attained his sixty-sixth year. He has now employed arsenious acid for ten years in cases of apoplectic congestion, and states that the results have always been successful. He commences the treatment, however, by bloodletting, the quantity drawn being in proportion to the urgency of the symptoms. The conclusions which Dr. Lamare-Picquot draws from his experience are as follow: 1. Apoplexy is misunderstood as to its nature. 2. The effusion of blood observed in some cases is only a secondary phenomenon. 3. It is easy to overcome the preliminary symptoms of apoplexy. 4. Apoplexy is always caused by an immediate increase of the blood-corpuscles. 5. Arsenious acid is a valuable remedy in all cerebral congestions. 6. Its first effect appears to be to render the blood less rich in corpuscles and less plastic. 7. It is indispensable, before commencing the arsenical treatment, to ascertain the condition of the blood. 8. The medicine should always be given at meal times, in order to facilitate its assimilation. 9. It is necessary to prolong the use of the arsenious acid beyond the period of cure, in order to render the effects more durable. 10. The arsenical treatment diminishes the fatal consequences of cerebral congestions, when patients are predisposed to apoplexy by a sanguineous temperament. 11. Although arsenious acid is a most useful remedy, it cannot be considered as infallible in its operation, and idiosyncracies must always be studied. 12. The dose of arsenious acid is from four milligrammes to one centigramme each day (a centigramme is 0·1543 of a Troy grain.)

On the Therapeutical Effects of Bromide of Potassium.[‡]—Dr. Pfeiffer, of

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[*] Bulletin Général de Thérapeutique, June 15th, 1859.

[†] Ibid., Sept. 15th and 30th, 1859.

[‡] L'Union Médicale, Aug. 30th, 1859.

Paris, has confirmed by his researches the opinions of other physicians as to the sedative effects of bromide of potassium over the generative organs; he has found that the salt possesses a decided power of modifying abnormal erections and diminishing the frequency of seminal discharges. He has arrived at the conclusion that bromide of potassium exercises a special influence over the muscular part of the genito-urinary apparatus, and at the same time induces a characteristic modification of the secreting function of these organs. Dr. Pfeiffer has administered it also with success in neuralgia of the neck of the bladder. He commences with the dose of half a centigramme every day, and increases it gradually up to two or three grammes a day.

*On the Use of Chloroform in Itch.**—Professor Bock has found the external application of chloroform useful in some cases of itch. This substance appears to kill the insect, and, moreover, by producing anæsthesia, it relieves the irritability of the skin. M. Bock has never observed any inconvenience to arise from the use of chloroform, and the sensation of burning which it produces for a short time, is quite trifling in comparison with the intolerable itching caused by the disease.

On the Treatment of Oxyuris Vermicularis.†—M. Compérat has proposed a new remedy for the cure of the *oxyuris vermicularis*, and states that it has always succeeded in his hands. The plan is to administer five, ten, fifteen, or twenty drops of sulphuric ether in an injection of cold water, and to repeat the operation a greater or less number of times, according to the number of the worms and their greater or less tenacity of life. The ether is said to have the advantage, by its tenuity, of easily impregnating the larvæ, and consequently killing the animalcule *in ovo*, and also, by its anti-spasmodic properties, of soothing the general and local nervous phenomena which may be occasioned in the rectum by the presence of this parasite.

On the Treatment of Intermittent Fevers by the Inhalation of Quinic Ether.‡—Quinic ether is obtained by distilling alcohol treated with sulphuric acid in presence of the quinate of lime. The product of this distillation is a perfectly limpid, colourless liquid, of an agreeable smell, less volatile than sulphuric ether, but still sufficiently volatile to disappear at ordinary temperatures without leaving any residue. M. Eissen states that when inhaled in the dose of two to three grammes (three grains to three-quarters of a drachm) like chloroform, it arrests a paroxysm of ague which has already commenced, and prevents the recurrence of future attacks. The editor of the *Union Médicale* doubts, however, whether the beneficial effects are not due to the ether alone, and, in fact, kinic-acid is known not to possess the tonic and antiperiodic properties of quinine.

On the Treatment of Vaginitis and Superficial Inflammation of the Neck of the Uterus by Tannin Ointment.§—Dr. Foucher has observed that tannin combined with lard is an excellent local application for vaginal inflammations; and that ointments are preferable to injections, because they remain better in contact with the inflamed mucous membrane. In cases of simple vaginitis, he introduces every morning, by means of the speculum, into the vagina where it is in contact with the neck of the uterus, a large piece of wadding smeared with a thick layer of tannin ointment. A thread is attached to this wadding, so that the patient can remove it herself. Dr. Foucher has employed the same treatment for leucorrhœa, and he states that it has been successful, although in many cases constitutional remedies are necessary in addition to the local application.

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* Schmidt's Jahrbuch., Aug. 7th, 1859.

† L'Union Médicale, July 19th, 1859.

‡ Ibid.

§ Bulletin Général de Thérapeutique, May 15th, 1859.

On the Properties of the Taxus Baccata.[*]—Dr. Schroff has made a series of experimental investigations upon the chemical and medicinal properties of the taxus baccata, or yew, and he arrives at the following conclusions:—1. That the fruit of the yew, as has been already observed, possesses no poisonous properties. 2. That, on the other hand, the leaves possess decidedly poisonous properties, and that they contain an acid and a narcotic principle, although neither has hitherto been obtained in a pure state. 3. Ether extracts two active principles, and this is effected in a less degree by water, which appears to take up the narcotic constituents; alcohol appears to take up two principles in pretty equal proportions. The ethereal extract is the most powerful, the next is the alcoholic, and the watery extract is the weakest. 4. The alcoholic extract of the leaves loses its poisonous property by keeping. The researches of Dr. Schroff have also proved to him that the opinion entertained by some physicians of the similarity of operation between the properties of the yew and those of digitalis rests upon no certain physiological basis. When it is required to employ the yew-leaves for medical purposes, the alcoholic and the ethereal extracts are the most suitable preparations; the former in the dose of one to two grains, and the latter in the dose of a quarter to half a grain.

On the Administration of Cod-Liver Oil with Bread.[†]—M. Bassie has invented a method of administering cod-liver oil with bread, which he calls, "huile de foie de morue panée," and which is prepared in the following manner. The bread is broken in pieces, and roasted at a moderate heat, and then thrown into a tinned vessel with some water, so as to obtain a decoction; it is then passed through a straining cloth under gentle pressure, and the strained liquid is exposed to a gentle heat until it has assumed a gelatinous consistence. White sugar and isinglass are then added, and the mixture is withdrawn from the fire and allowed to cool, when a little tartaric acid is carefully mixed with it. The bread jelly thus prepared is afterwards mixed with cod-liver oil, and flavoured with canella and essence of lemons. The white oil, and of the best quality, is to be preferred for this preparation.

Lotion for Mentagra.[‡]—M. Richard has recently called attention to the good effects which he has seen from the application, in patients affected with mentagra, of a lotion composed of sulphate of zinc and sulphate of copper in distilled water. After the employment of ordinary remedies, and when the affected part is cleaned from the crusts which cover it, the lotion is applied frequently; and under this treatment it has been found that the disease disappears in a comparatively short period.

On the Alterative Properties of Podophyllum and Leptandria.[§]—Dr. R. E. Haughten, of Indiana, states that, in order to save his patients from the severe effects of calomel, he resolved to try substitutes milder in their operation, but equally efficacious as alteratives. He found that podophyllin (the active principle of podophyllum peltatum, or May apple), combined with leptandrin (the active principle of the leptandria Virginica), in the proportion of half a grain of the former to three or four grains of the latter, formed a very good and efficient alterative, producing no nausea, pain, or other unpleasant symptom. It is added that the leptandrin is an excellent alterative alone, producing augmented biliary secretion, and thus becoming a valuable adjunct to other remedies in the treatment of disease.

Iodide of Potassium injection in Leucorrhœa.[‖] In the 'New Orleans Medical and Surgical Journal,' a solution of iodide of potassium (one drachm and a half to eight ounces) is said to have proved serviceable in the treatment of leucorrhœa, being introduced into the vagina in the form of injection three or four times a-day. Injections of Castile soap and water are recommended also, as adjuncts to this treatment, and are themselves sometimes curative.

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[*] Zeitschrift der Gesellschaft der Aerzte zu Wien, Aug. 1st, 1859.

[†] L'Union Médicale, June 15th, 1859.

[‡] Ibid.

[§] North American Medico-Chirurgical Review, Nov. 1858.

[‖] Ibid.

Chlorate of Potash Injections in Leucorrhœa and Ulceration of the Os Uteri.[*]—Dr. B. Brown, of North Carolina, gives an account in an American journal, of two cases in which he used injections of the chlorate of potash (one drachm to eight ounces of water) in leucorrhœa and ulceration of the os uteri, with the best results. Dr. Brown mentions a case of gonorrhœa in a female cured by the same remedy.

Iodine in Ovarian Tumours.[†]—Dr. Roemaer, in an American journal, relates his successful treatment of ovarian tumours by the internal and external use of iodine. His formula for the former was iodine, one drachm; iod. potass., two drachms; of distilled water, six ounces. Dose, a desert spoonful four times a day. The external application was made by painting the surface of the abdomen between the pubes and the umbilicus, on the left side, towards the groin, twice daily. In four cases thus treated the ovarian enlargement was entirely removed.

Iodide of Potassium in Asthma.[‡]—A writer in the *Boston Med. and Surg. Journal* speaks of having employed the iodide of potassium in a number of cases of asthma, without having been disappointed in its effects in a single case. It appears that there is a patent medicine manufactured at Boston, and sold wholesale and retail by the druggists of that city, which has obtained a reputation as a specific in asthma. An analysis of a bottle of this medicine showed that iodide of potassium was one of its chief ingredients.

On the Use of Croton Oil in Dropsy.[§]—Dr. J. L. Stevenson, of Stratford, Canada, relates in the *Montreal Monthly Journal* some cases of dropsy cured by croton oil. The oil was given in the dose of a third of a drop to half a drop every morning. Dr. Stevenson believes that the effects of the croton oil are due more to its stimulating the absorbents than to its drastic properties, for in his first case it caused only three or four evacuations every morning, and in the second case never more than two, and in neither of the cases did the oil cause any griping.

Quinine in Asthenic Pneumonia.[‖]—Dr. J. D. Boyd, of Abbeville, North Carolina, relates in the *Charleston Med. Journal and Review* a successful case of treatment of asthenic pneumonia by quinine. In this case, which was of several days' standing, the patient had been previously purged and blistered. The state of the patient being one of extreme danger, Dr. Boyd determined to try the effect of large doses of quinine. Five grains of quinine were therefore administered every three hours, and in less than twenty-four hours a marked change for the better was evident. The same treatment was continued for three days, during which a rapid improvement took place, and the patient was nearly well on the fifth day of the trial of the new plan.

Ergot of Wheat as an Ecbolic.[¶]—Dr. McGugin, in the *Iowa Med. Journal*, relates a case in which, after the expulsion of a fœtus of between three and four months, the placenta was retained and the os uteri so tightly closed as to preclude any resort to mechanical means for its removal. Ergot of rye was given in drachm doses, but without effect. Dr. McGugin saw in a field of wheat several parasitic grains on many of the heads, similar to, although less than ergot of rye. A large tablespoonful of this substance was gathered, and a decoction was made, which in less than half an hour after its administration awakened the contractile power of the uterine fibres, and the placenta was thrown off in a decomposed state, after which the woman recovered rapidly.

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[*] North American Medico-Chirurgical Review, Nov. 1858. [†] Ibid. [‡] Ibid. [§] Ibid. [‖] Ibid. [¶] Ibid.

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THE

BRITISH AND FOREIGN

MEDICO-CHIRURGICAL REVIEW.

OCTOBER, 1860.

PART FIRST.

Analytical and Critical Reviews.

REVIEW I.

1. *Traité des Maladies Mentales.* Par le Docteur B. A. MOREL, Médecin-en-chef de l'Asile de Saint-Yon (Seine-Inférieure); Lauréat de l'Institut (Académie des Sciences); Membre Correspondant de l'Académie Royale de Savoie, de l'Académie Stanislas de Nancy, de la Société d'Emulation de l'Ain, des Sociétés de Médecine de Nancy, de Metz, de Gand, de Lyon, &c.; et Membre de l'Académie des Sciences, Belles-lettres, et Arts de Rouen.—*Paris,* 1860. pp. 866.

A Treatise on Diseases of the Mind. By Dr. MOREL, Physician-in-chief to the Asylum of Saint-Yon, &c.—*Paris,* 1860.

2. *La Psychologie Morbide dans ses Rapports avec la Philosophie de l'Histoire, ou de l'Influence des Névropathies sur le Dynamisme Intellectuel.* Par le Docteur J. MOREAU (de Tours), Médecin de l'Hospice de Bicêtre.—*Paris,* 1859. pp. 576.

Morbid Psychology in its Relations to the Philosophy of History, or on the Influence of the Neuropathies on Intellectual Dynamism. By Dr. MOREAU, Physician to the Bicêtre.—*Paris,* 1859.

3. *Allgemeine Pathologie der Seele.* Von Dr. ADOLPH WACHSMUTH, Privatdocenten für Allgemeine Pathologie und Klinische Medicin, Assistenten des Medicinischen Poliklinik in Göttingen.—*Frankfurt,* 1859. pp. 348.

General Pathology of the Soul. By Dr. WACHSMUTH, Lecturer on General Pathology and Clinical Medicine at Göttingen.—*Frankfort,* 1859.

IT is a matter of common verbal observation by the non-medical community, as also by many members of our own body, that nothing can be more monotonous and uninteresting than the study and practice of psychological medicine. We have heard the remark made again and again, both within and without the pale of the profession. And we find it difficult to understand at the first glance what can have given rise to such an idea and fostered the propagation of such an opinion. For surely if it be a noble thing to minister to the purely physical ailments which beset us in so many and such insidious forms, something of an equally high character is involved in the treatment of that part of man's nature by which he is distinguished from the lower creations, and led to aspire to something which "eye hath not seen, nor ear heard," but to which an illimitable faith gives the assurance of a prospective reality. The difficulty, however, seems in some measure to diminish, when we consider what a vivid impression has been made upon us, in reference to insanity, by the bequeathments of an earlier generation. Hogarth did not live and breathe life into the canvas for a single age. Cibber did not cause the marble to assume a living shape for a period of the same limited duration. They have opened by their genius the mad-house doors of their own day, and given to this and to every future day an objective picture of the horrors from which modern science and philanthropy have emancipated us. Moreover, we have still with us, in the treasured literature of the last and earlier part of this century, the subjective tracings of boundless misery.

There is no one, in truth, in the present time, who is not aware of the large and abundant beneficence of the modern treatment of insanity. But it happens that there is no one, howsoever deeply impressed with this conviction, who is not in some sense familiar with the antecedent miseries to which we have alluded; and so overpowered by the thought of them as to attribute to the specialty of the psychologist a character to which it is by no means entitled. It is neither monotonous nor uninteresting. Its variety is proteiform; its interest is not to be surpassed; its comprehensiveness is not to be measured; and there is no limit to its practical utility. The elaborate perfection of the physical and moral machinery by which the diviner element is restored to the fallen, woos the heart and understanding of every philanthropist. And we are certain that no aspirant ever embarks in this special study, without becoming more and more enamoured of it as he proceeds, and more willing to surrender his entire energies to that which is beset with so many difficulties and complications. These difficulties and complications, indeed, are the very circumstances which invest psychology with such peculiar interest, and enable the student to realize the intense fascination which is added to the investigation of physiological functions, when he is necessitated to step upon a higher platform, and (in the words of Guislain) "faire l'analyse des fonctions de l'intelligence, bien connaître l'expression physiognomique des passions, la valeur des idées, la portée des actes et de la parole, et prendre pour guide les faits et l'homme vivant."

It will be admitted, too, that psychological study in this country has derived much additional interest from the beautiful character of its literature. And it can be no exaggeration to state that the writings of Dr. Conolly and others have lent a charm to the subject of mental alienation quite independent of its own intrinsic importance. Drs. Forbes Winslow, Monro, Noble, Bucknill, Tuke and others, have laboured, and are still labouring, successfully in the same field; and the joint production of the two latter physicians,* published little more than twelve months ago, is the most comprehensive and practical English work upon insanity now extant.

Nor have our neighbours on the other side of the Channel been less progressive than ourselves. Both in France and in Germany improvements have been coeval with those which have obtained in Great Britain. Pinel and Esquirol have given an imperishable character to psychological literature; and their mantle has fallen gracefully upon worthy successors. M. Morel is the author of several learned works upon the subject to which he has devoted the energies of his life; and we are familiar with his 'Etudes Cliniques,' as containing some very remarkable lithographic portraits of the physiognomy of insanity. He is well known in France as an accomplished physician and earnest philanthropist. We have a peculiar pleasure, therefore, in drawing the attention of our readers to a work which is calculated to enhance the reputation of its author, and advance the interests of the most suffering portion of mankind, by placing before the medical profession, stamped with photographic accuracy, the physical and moral deviations which constitute insanity. Armed with its eminently practical contents, the student will be prepared to meet every variety of cerebral disturbance; and he will at the same time be struck with that comprehensive philosophy which would seek to anticipate evil, and regard disease as much under a *preventive* as under a *curative* aspect.

This circumstance gives an immense value to M. Morel's dissertation upon the etiology of insanity. We pass to it, therefore, at once, merely observing that the chapters thereupon are preceded by a very interesting historical sketch of the various theories and opinions which have obtained from the time of Hippocrates until now. Since the beginning of the present century those theories have resolved themselves into three different schools, each having its various representatives. They are respectively the materialistic school, the immaterialistic school, and the school which, by a "theory of conciliation," attaches itself to both of the preceding, now attributing disease to purely mental, now to purely somatic causes. Of the materialistic school, which is alone based upon purely pathological facts, our author is an earnest disciple.

It may be stated, without fear of contradiction, that the accuracy of our statistics of insanity will be in the measure of our true acquaintance with its etiology. And yet (paradoxical as may seem the affirmation) the more we investigate our statistics, and attempt to formulate our experience, the more certain do we become of the difficulty of defining the real causes of disease: for our anxiety to *tabulate* increases our desire to *define*, and dwarfs the due importance of many collateral circumstances which exercise an influence in the factorship of mental alienation, only to be appreciated by the most conscientious and delicate observers. So that we have to strike out a *via media*, equally removed from the hard outlines of the statistician, and the fanciful shadings of the ingenious theorist.

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* A Manual of Psychological Medicine, &c. London, 1858.

Let us illustrate this by the question of drunkenness.

> "If we consult our statistics, we see drunkenness figure among the *physical causes* of insanity. Undoubtedly, if we confine our observation to the mere action of an inebriating substance, alcoholic excess may be pronounced a physical factor of disease. But if we notice that drunkenness is a complex phenomenon, and that some give way to it from the effect of habit, and others that they may shut out the reality of a severe affliction; that in various individuals addicted to this vice there is a real morbid tendency to it, by reason of some pre-existing cerebral affection, or some hereditary prejudicial influence, it becomes immediately evident that the etiology of disease can alone illumine the path which leads to its pathogenic elements." (Morel, p. 78.)

M. Moreau (from whose elaborate and philosophic work we shall more than once have occasion to quote before we propound his theories) also observes:

> "Drunkenness is regarded as one of the most frequent causes of insanity. And assuredly the fact is not to be doubted. But it is equally certain that drunkenness, or rather *the taste for drink*, is as often, and even more frequently, a first symptom (the effect, therefore, and not the cause) of disease." (pp. 136—7.)

And this taste, he affirms elsewhere, has been hereditarily transmitted from the parents to the offspring, just as the same features, and gait, and colour of hair and complexion. "I receive insane patients daily at the Bicêtre, in whom I can trace back the origin of their malady to nothing else but the habitual intoxication of their parents." (p. 157.)

Esquirol long since gave utterance to something like the same truth when he wrote:—"If the abuse of alcoholic liquors is an effect of mental depravity, of educational vices, and the force of bad example, men sometimes give way to it by reason of a morbid impulse, which they have not the power of resisting."*

M. Morel also remarks:

> "It is not necessary to create a monomania, of which the chief characteristic is an irresistible tendency to fermented liquors. That tendency is most frequently only the symptom of a principal disease, especially when it is suddenly developed in persons who previously had given no evidence of such a propensity." (p. 418.)

And M. Moreau alludes to a very striking fact: that

> "A large proportion of those who become insane by reason of alcoholic excess, have had insane or highly nervous parents: that a great number of them would never have become drunkards if a particular nervous state, consisting of an imperious and irresistible want—some '*surexcitation nerveuse*'—had not dragged them into the indulgences in which they find relief." (p. 120.)

These views indeed may but ill accord with the narrow and baseless theology of many who profess to teach us of high and holy things;

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* Des Maladies Mentales, vol. ii. p. 74.

but we know that a daily augmenting number amongst us believe in them and embrace them. That excellent divine and philanthropist, Mr. Kingsley, has clearly been educated in the same expansive school as our authors, for he expresses the same truths to which they have given utterance, in the following language:

> "I am one of those who cannot, on scientific grounds, consider drunkenness as a cause of evil, but as an effect. Of course it is a cause—a cause of endless crime and misery; but I am convinced that to cure, you must inquire, not what it causes, but what causes it."*

And the complications of etiology become the more obvious, if we now reverse the matter, and see how frequently the real *exciting cause* of disease is overlooked, and how the very same calamity may shape out the same result in two different individuals, while our limited knowledge of antecedents may lead the physician to assign to various causal phenomena that which eventuates from those of a strictly identical character. Thus the loss of wife or child will give rise to intense depression of spirits, leading one man to seek consolation in the beer-barrel, and another in the Bible. The election to either service depends upon that peculiarity of temperament which we term *idiosyncrasy;* upon the previous habits, taste, education of the individual, and a crowd of hereditary predisposing influences.

By an injudicious and ill-regulated use of both the comforts alluded to, they are diverted from their legitimate purposes. Insanity is the sequel. But under what headings are we to classify the two cases? One is due to a physical cause, we say, and write *drunkenness:* the other is due to a moral cause, and we write *religion.* Whereas the real exciting cause in both instances was the death of hope and the birth of despair, in two natures not so different from each other as the later development of their tastes would seem to imply; and both equally predisposed to foster into a morbid growth that mysterious germ which receives its vitality from the accidents of the terrestrial life. Meet it how and where you may, the etiology of insanity is beset with difficulties of this kind, which limit the exactness of our knowledge, and demand the calmest judgment of the observer. They help to explain the great variations in the statistical tables by which the proportion of insane persons is estimated in various countries; as also the not less striking variations, by different observers, in the *same* countries.

> "According to the most recent statistics, there is one insane person in every 1200 of the population, in the different states of Germany. In France, a gross number (according to some) of 18,350, and (according to others) of from 30,000 to 32,000 lunatics, will yield, respectively, 1 insane person in 1900, and 1 in 1000. But still, in this estimate there should be a division made between the smaller towns and those great centres of commercial industry where the relative proportion is always greater than in agricultural districts.† In England the number of insane is greater than in France, and attains in Scotland the high ratio of 1 in 513. The statistics, indeed, of Dr. Maria Rubio, framed in 1848, put the North British figure at 1 in 417. The

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* Lecture delivered at Bristol in 1857. See Miscellanies, vol. ii.

† The average of the agricultural counties of England (1857) is 18·37 per 1000; of the manufacturing counties 26·40 per 1000.

mean average of his calculation will be found to be 1 in 446 in the canton of Geneva, 1 in 550 in Norway, 1 in 816 in Belgium, 1 in 700 in England, 1 in 1223 in Holland, 1 in 1667 in Spain, 1 in 1773 in France (there being about 21,000 insane), 1 in 2125 in Ireland, 1 in 3690 in Italy, 1 in 5818 in all the Piedmontese possessions. For Russia the average is still lower. In these statistics, where France, we think, should figure at a higher average, we meet with considerable and hitherto unexplained disproportions; since Scotland is rated at 1 in 417, whilst Piedmont only attains the level of 1 in 5818. It is evident that amongst the insane of the latter country are not included those degenerate beings termed *cretins*, whose terrible affliction is dependent upon the geological structure of the soil, and who people in great numbers the valleys of Martigny and Aosta, and the mountainous districts of the Alps. The same anomaly shows itself in various departments of France; since if we estimate its average by the lunatics in the asylums of Saint-Yon and Quatre-Mares, the proportion for the Seine-Inférieure will be as 1 to 650 or 700 of the inhabitants." (Morel, p. 80.)

But however marked may be the variations in these tables, there appears to be but one opinion as to the influence exercised by *civilization* in the factorship of insanity. And there is no doubt that the various countries of Asia and Africa indicate a figure less relatively high than those of Europe. At the same time it must not be overlooked, that the means of ascertaining the proportions in the former countries are of necessity greatly neglected. For the very machinery by which we tabulate is itself one of the most important elements of modern civilization. Only until very recently, indeed, has this element been brought into efficient play among ourselves. Nor must we fail to observe that civilization is a term of an extremely indefinite and misapprehended character, involving many ingredients which are essentially demoralizing. If it improves the quality of the social wheat, it multiplies a thousandfold the social tares. For instance: one of the leading features of civilization is an increasing tendency to gregariousness—to the grouping together in large towns and villages. This grouping is for reciprocal mercantile, scientific, and other purposes, and for the general development of the social economy. Under it a vast proportion of the people are better educated, and their tastes more cultivated and refined; the social and intellectual standard is elevated for those who embrace the means of improving themselves. But how augmented are the vices to which all are exposed, as also the opportunities of gratifying them! What a scene of strife and contention does life become; how largely are the physical powers over-taxed, and through that overpowering, the moral nature perilled. What a struggle there is for very existence; what incidents are crowded into a life of thirty years, which should have extended over twice that number! What victims do men find themselves from the very cradle to the grave, under "the iron foot of material laws!" What a whirl of violence, and passion, and spasmodic energy is the ordinary life of the mechanic in the great centres of industrial commerce! The very air he breathes is poisoned by products unknown in lands as yet unenlightened by the beams of our progressive day. And railroads, and share-markets, and joint-stock banks, and casinos, and betting rings, are not they a part of civilized times; and have they not written their records in the too legible characters of physical and moral disease? Our gaols, our asylums, and our reformatories announce the terrible realities of civilization, while they tell also of our struggles to grapple with the evil, and attest the largeness of our humanity. We are not, therefore, to turn back to the past, because we go mad in the present, and may go madder in the future. It is ours to strive that it should be otherwise, to restrain the high-pressure tendency of the age, and ameliorate by harmonious adaptiveness of the lesser wheels that elaborate machinery which constitutes society.[*]

To do this effectively we must become more imbued with that philosophic spirit which leads to more careful investigation, and to the tracing the power of seemingly trivial incidents, and small but constantly recurring facts, in producing mental alienation. Until such steps are taken, the etiology of disease will remain shrouded in comparative obscurity, and we shall be far from attaining that "ultimate civilization" which is the hope and desire of every enlightened nation. The very demand of the middle and upper classes for hot rolls at breakfast deprives ten or twelve thousand human beings of refreshing sleep at the time indicated by nature for the lowering of human eyelids. Will anyone who knows the delicate structure of the brain, of her imperious requirements, of the facility with which the cerebral forces are unbalanced, say that there is no connexion between these rolls and insanity? Does not their nocturnal fabrication at least predispose the journeyman baker to mental disease?[†] There are incidents, too, of apparently lesser moment than these—incidents never suspected or alluded to—fraught with overwhelming power, and capable of affecting for all time, and something beyond time, the destinies of an immortal being. A silly name given by silly parents, or a pair of "bandy legs" given by Nature, have been the absolute ruin of many a boy of nervous and impressional temperament, and surrounded him with danger from the cradle to the grave. As thus—the name and the legs have provoked habitual laughter—that weapon, as Luther expresses it, which "disconcerts the devil, and makes him run like a fool;" the laughter has influenced character, the character has influenced life, and life and death together have influenced—oh, what tremendous interests! In this way a physical deformity conditions a specialty for its unhappy victim which may embarrass every moment of his career and every act of his life. And a baptismal appellation fit rather for the reign of Jehoiakim than that of Victoria, though prompted by parental piety, may eventuate in filial alienation. We have known a little Habakkuk at a royal foundation school who was literally crushed under his prophetic nomenclature, and who, teased and tormented, died delirious, whereas had he been John or William he might yet have been living. "What's in a name?" More than we think of.

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[*] The following is in every sense the growth and product, and illustrates the exacting service, of modern civilisation:—"Samuel Price, examined. Mr. Butt: How did you awake them (alluding to the little children of Mr. Ainsworth's establishment, near Bolton, when they fell asleep, 'standing at their work')?—Many a time by shouting, and at other times getting a board and rapping it on the table, making a loud report that used to startle them; and *I could keep them awake then for an hour, or more than that, perhaps, by frightening them.*"—Report of the Commissioner appointed to inquire how far it may be desirable to extend the provisions of the Acts for the better Regulation of Mills and Factories to Bleaching Works, pp. 88, 89, Nos. 1849, 1662. How clearly the philosophic eye can see into the future, and connect in a proper relationship with "revivalism," and its fruit, insanity, this frightful over-taxing of the vital forces of childhood!

[†] See an interesting paper, entitled "Bondage in the Bakehouse; or the Case of the Journeyman Baker," by John Lilwall, Esq., Hon. Sec. of the Early Closing Association; read before the "National Association for the Promotion of Social Science," at Bradford, in November, 1859.

The question of civilization, then, may be stated in this form: if by it is meant that personal regulation of thought and feeling which never admits of undue introversion, but finds its legitimate culmination in a sphere of active usefulness; if by it is meant that harmonious balancing of the affections, that systematic culture of the understanding—in a word, that perfect coaptation of heart and head which constitutes "symmetry of character," then that *is* individual civilization in its highest form, and its aggregate constitutes a considerable section of society. It is, in fact, a predisposing power which protects men in no stinted measure from the assaults of all that is physically and mentally deteriorating. And we do not hesitate to subscribe to our author's proposition, when he says (so happily that we prefer giving the original)—

> "Je pense que la raison humaine, examinée dans son expression la plus large, est établie d'une manière bien plus solide là où les grands principes du perfectionnement physique et moral de l'homme, ayant pour base la vérité et le sentiment religieux, rayonnent dans le sens le plus absolu, et le plus fécond de leur action civilisatrice." (Morel, p. 82.)

But there is another side to this picture. Civilization (as we have previously intimated) is something more than this—

> "In the steamship, in the railway, in the thoughts that shake mankind."

It involves, and is accompanied by, so much that is powerful by endless complications for evil, that it becomes no marvel that insanity marches with it in the direct ratio of its increase. And we are bound to endorse the opinion of Dr. Rush, when he writes—

> "I am not one of those modern philosophers who derive the vices of mankind from the influence of civilization; but I am safe in asserting that their number and malignity increase with the refinements of polished life. To prove this, we need only survey a scene too familiar to affect us; it is a Bedlam, which injustice, avarice, pride, vanity, and ambition have filled with inhabitants."

There is no doubt, therefore, that Drs. Bucknill and Tuke have arrived at correct conclusions, when they affirm that insanity attains its maximum development among civilized nations; remaining at a minimum among barbarous nations, as well as among children and animals below man.

We turn now to a question which engages the earnest attention of M. Morel, and which (we agree with him in thinking) has been almost always misapprehended—the influence exercised by religion in connexion with insanity. This very misapprehension should alone give to the subject peculiar interest, and make us desirous to elucidate what attracts an unusual amount of interest at this time, when we are recovering from the terrible effects of a pseudo-religious scourge which has been gifted with the name of Revivalism, and claimed for itself a divine origin.

It is difficult to say whether any inferences of a reliable character are to be drawn from the statistical evidence previously advanced, concerning the relative proportions of the insane in various countries. Whether or not we comment upon the fact, attention may at least be drawn to the circumstance, that no country in the world makes higher religious professions than Great Britain, fructifies so largely in religious societies, or has such elaborate machinery in operation for converting the wayward, and "turning many to righteousness." Yet she figures very high in the alienistic tables, and her average is far greater than that of an equally civilized country—France. And if Scotland be taken by itself, where there is the nearest approach made to the morbid sanctimoniousness of the Puritan, and where religion is essentially of a subjective character, it is observed that she reaches a higher mean than any other country in Europe. It may be whisky, it may be porridge: we do not say it is not. But whisky and porridge may be more fertile in the production of insanity, where the national character is under the domination of certain predisposing religious influences, which shade into national uniformity (though in a different measure) both the evil and the good. Next to Scotland comes the Canton of Geneva (whisky is not the national beverage, nor is porridge the national food), where the religion more nearly assimilates to the severely subjective character of Presbyterianism. Afterwards come two other Protestant countries—Norway and England. It is not our intention, we repeat, to make any comments upon these facts, because such comments might be liable to misinterpretation; but we deem it right thus to allude to them before proceeding further into this mysterious field of investigation.[*]

"Religious fanaticism," says Esquirol, "which at various times has given rise to so much insanity, seems to have lost its influence in the present day, for it very rarely produces that result." It must be remembered that the great physician wrote this at a time when France was flooded with infidelity, when religion was completely clouded, when the rapid whirl of political events and the wild ambition of the first Napoleon absorbed the universal attention of the French people. If we could draw aside the curtain which screens Esquirol from our gaze, and fix his eyes upon what religious fanaticism has been doing in Ireland during the last two years, he would no longer give expression to this sentiment.[†] He would rather assent to the proposition of his disciple, M. Morel, and affirm that an unhealthy exaggeration of religious feeling is, in these times, varying with the subtle influence of combined predisposing phenomena—a very fertile cause of mental disease.*

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[*] Caspar confirms the statistics of earlier writers, that suicide (so commonly the result of religious melancholy) is more frequent in Protestant than Catholic countries. Denkwürdigkeiten zur Medicinischen Statistik, p. 139. Berlin, 1816.

[†] "Among the fruits of hysteria as a means of religious revival, I must notice the insanity which it has already produced. In a very brief space of time, and in a very limited circle of inquiry, I saw or heard of *more than twenty cases.*" 'The Work and the Counter-Work,' by Archdeacon Stopford, p. 60.—"Speaking guardedly, I may assert that I have come to the knowledge of *at least fifty such cases* (acute mania and theomania) within the last six months, in this immediate neighbourhood." 'Ulster Revivalism; a Retrospect,' by the Rev. W. M'Ilwaine (see 'Journal of Mental Science' for January, 1860, p. 195.)

But it is not with fanaticism that we are immediately and directly concerned. We have to meet something of a less obviously coercing character, and inquire whether "the true spirit of Gospel Christianity" (to adopt the language of the schools) is capable of producing mental alienation. The noble president of the Commissioners in Lunacy, in his evidence before the Select Committee of the House of Commons, affirms that it is not; as though any one had ever stated that, absolutely and abstractedly, religion was endowed with such a capacity, and had used the circumstance as an argument against its propagation. "I will never believe," he says, "it has had the slightest effect in producing any aberration of reason whatever." Now, so vast are the complications of insane etiology, and so multitudinous are the combined predisposing influences, that it is quite impossible to insulate one causal phenomenon strictly and absolutely from another. Religion can no more be regarded as a sole factor of insanity, than it can make any just claim to a monopoly of curative power. The endeavour to establish the proposition, that wherever religious influences have been concerned in the production of mental disease, they must of necessity have assumed a fanatical type, is a complete failure; though undoubtedly it is prompted by a laudable jealousy of any attributes save those of a strictly benignant character being assigned to the Christian faith. But any one who regards this subject in a philosophical, comprehensive, and unprejudiced spirit, will acknowledge that some minds are so constituted, and hereditarily predisposed, that put religion before them how you may, they are certain to make shipwreck of it. We are not saying—we are very far from saying—that this is the rule. On the contrary, we believe it to be the exception; and that where individualities of character are properly studied by a religious teacher, and the gospel narrative regarded not as that complete something which "*is* truth," but as that necessarily and designedly incomplete something which by legitimate use is intended to "lead us into all truth," the chances of morbid perversion are very limited. At the same time we are bound to attribute a large proportion of religious insanity to that school of teaching which most seeks to separate Biblical from all other teaching, and is most zealous for what is termed "gospel purity and integrity." There are *two* "Books of Life," and they must be studied correlatively and co-ordinately to produce the fruit which perisheth not; and we must be cautious of confounding "the Christian religion [which] has been tried for eighteen centuries," with "the religion of Christ [which] remains to be tried." The neglect of "those secular standards which heretofore coexisted with, and supplemented, the Christian ethics,"† and the substitution of (what Dr.

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* The statistical tables of the French Asylums for the year 1853 yield 279 men and 615 women, as rendered insane by religious influences. Statistique des Etablissements d'aliénés en France, de 1842 à 1853.

† J. S. Mill.

Conolly happily calls) "foolish and abominable denunciations" by ignorant preachers, has resulted in a miserably servile type of character, and opened the door to that revivalism which finds its legitimate field among the most ignorant, as amongst the most physically and mentally deteriorated of mankind.

It will be admitted, therefore, that the part played by religion in the factorship of insanity cannot be mapped out with anything approaching to logical precision, because man cannot be isolated from the inheritance of predisposition, and from the ever-present reality of immediate social and other influences; because the book upon which the Christian religion is based admits of the most varied interpretation by the most varied religionists, and because even those who embrace theological views strictly identical have not an equal capacity for putting those views before individual minds. Given a man perfect in his material and immaterial structure, and a creed which admitted of no manner of doubt (and therefore required no exercise of faith), then probably no psychical disturbance could result from their contact. But where is such a man? He is not to be found. Mortality is not put before us in this shape. "When God," says Montesquieu, "created the brains of human beings, he did not intend to guarantee them." Nor is such a religion to be found. Its Founder never intended such a religion for us. He knew, and he foretold, that its very incompleteness would produce endless antagonism, and therefore endless liability to mental disquietude. The history of eighteen hundred years has verified all He said of it; and He said what He did because He "knew what was in man." He knew then what all time has been teaching us since, and what shall be more abundantly demonstrated as we march on to "join the nations underground," that whatever is suggestive of doubt, involving, too, stupendous interests and overpowering considerations, is likely to produce insanity. Religion does not produce mental aberration because it *is* religion, but because it does not enjoy an immunity from tumultuous and disturbing elements. Nothing can surpass the magnitude of the implications and direct teachings of the Gospel; nothing, therefore, can surpass their liability to disquiet and disturb, though undoubtedly this liability is tenfold magnified by the narrowness and the bitterness of conventional theology. As some minds are constituted, the sense of this magnitude is the germ and the element of their disease. This is the right way to put the question of religious insanity. And it is no evasion of the fact to say that religion has been misapplied where it issues in such a terrible result; for it does not do away the circumstance of liability to misapplication by the very construction of the thing received and its recipient. Moreover, that is no more than may be said of everything which has produced disease, whether the cause be physical or moral. Every cause of insanity is a cause by reason of some misapplication of that which *might not* have been misapplied, if we had been so perfect as to have no aptitude for misapplying it, or if it had been so adapted to our capacities as not to admit of misapplication. The truth is, however, that all great considerations involve great dangers, and evoke endless difficulties, which imperil the integrity of some, and ensure the proud triumphs of others. And so, there are scientific madmen—"the desire of the moth for the star"—and political madmen, and religious madmen, and drunken madmen; madmen, in fact, of every hue and shade, all of whom have been conditioned into their respective forms of misery as they have been brought within the sphere of scientific, or political, or religious, or alcoholic influences. And as the cerebral tissues of some men are so organized that they are unable to take the smallest quantity of stimulating drink without suffering from its prejudicial effects; so there are some men who cannot risk political turmoil, some who cannot trust themselves to metaphysical investigations; others, again, whose minds are so sensitive and impressional as scarcely to admit of sustained religious thought, or of anything which partakes largely of the introverting and subjective. On the other hand, there are those to whose physical integrity alcohol is absolutely essential; those who are never so happy as when occupied with the violence of political excitement; those to whom metaphysical speculations and inquiries are moral and intellectual life; and those, also, who can beneficially occupy themselves with religious thoughts and aspirations.[*] Upon a recognition of these truths, and upon a delicate appreciation of man's differential characteristics, will hang not only the successful moral and religious treatment of the insane, but also the power which one teacher has over another in protecting his disciples from the influence of things which are deteriorating. And the happiest religionist, and the one most capable of engrafting a sound religion on others, is not the man most familiar with Scripture concordances or mere Biblical facts, but the man who can combine with his theological lore a general information, and a cheerful spirit, and a discernment of individualities requiring different treatment, or different measures of the same treatment.

> "If education, or rather instruction, takes no cognizance of the special and innate aptitudes of the individual, it becomes a nullity, or almost a nullity. If it is not in harmony with those aptitudes, it cramps and stifles their development; in the same way, if they had been left free, their own peculiar energy would have resulted in works of genius." (Moreau, pp. 11, 12).

And so with religion; it must be adapted to individual wants and capacities. It is not meant (as Dr. Temple says) to "override, but to evoke the conscience."[*] It is the ignorant overriding which produces insanity. It is the delicate evoking which developes the perfection of Christian character. An exclusive religion is powerless for good; an inclusive one—that is, one which welcomes every subordinate help, makes her bow to the social science of the philanthropist, and take off her hat to hygiène—may achieve endless triumphs.

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[*] We have always regarded the case of the unhappy Cowper as admirably illustrative of the overpowering nature of religious thought in minds of that peculiar structure of which his was the type. He was clogged by a predisposition which necessitated for his healthy educational progress peculiar delicacy of treatment. So highly impressional and sensitive was he, such was the intensity of his personal consciousness, that he never could escape from his own miserable companionship. "Which way I fly is hell, myself am hell," became to him a horrible reality. "My feelings" (he writes) "are all of the intense kind. I never received a little pleasure from anything in my life; if I am delighted it is in the extreme." From the very earliest childhood the poet was the fettered victim of what M. Moreau calls "un état habituel de surexcitation." The magnitude of the interests involved in the Christian religion were more than he could embrace. The tremendous alternative alluded to as the destiny of the guilty completely shipwrecked him. And so, one of the gentlest and purest beings that ever lived, he did no more (though with less success) than Judas did—he "went out and hanged himself." "Satan (as the poet himself expresses it) is ever plying me with horrible visions and more horrible voices." History does not contain a more distressing picture.

History and experience, then, would seem to teach that religious fanaticism has ever been, and will continue to be, a fertile source of insanity. They teach, also, that the combination of secular with religious instruction, and the training up to active duties, are essential requisites to the establishment of a healthy and untormenting creed; that the general culture of the intellectual faculties, and the repression of emotional tendencies, together with the physical and social education of man, make up a most important element in shielding him from mental aberration, and from the inevitable dangers of a too frequent and too scrutinizing self-inspection. Nor are they less plain in affirming that the material and immaterial structures of some unhappy persons are so highly endowed with sensitiveness, either by the inheritance of predisposition, or by accidental idiosyncrasy, that whatever subject of stupendous interest is placed before them is almost certain to unhinge those faculties, the proper regulation of which constitutes mental integrity. It may be religion, or politics, or philosophy, according to the tastes, habits, and antecedents of the sufferer. But in either case an undue relative importance has been assigned to it, which has disturbed the moral or intellectual balance, destroyed the symmetrical proportions of character, developed psychical discordance—in a word, produced insanity.

Under his etiological disquisitions, there is a very important and curious subject alluded to by M. Morel, as bearing upon religion and modern civilization, and as illustrating the importance of a thoroughly healthy education of body and mind. According to Dr. Lisle,[†] the number of suicides committed by children under sixteen years of age, is greater by seven times than it was thirty years ago. And the learned Caspar has remarked a similar increase in Prussia during the last fifty years. His report is to the effect that there was only one infantine suicide at Berlin between 1788 and 1797; three between 1798 and 1807; whilst the figure attained the height of thirty-one between 1812 and 1821.[‡] This very distressing fact of the increase of youthful suicide shows, perhaps more clearly than any other which could be adduced, how subtle, and yet how coercing, are the predisposing influences which generate disease and crime. For the circumstance of educational improvement admits of no manner of doubt; and the general elevation of scholastic establishments in all that relates to their social and hygienic arrangements is a verity which cannot be contravened. Moreover, it should be added that in no European capital does education attain so high a standard as at Berlin; and that it is compulsory by the Government upon the people. How fearfully, then, do these things increase the responsibility of parents, by showing them that an indulgence of the sensual passions, and a general non-compliance with the teaching of well-ascertained physical laws, may so deteriorate and enfeeble their own offspring, as to render them incapable of benefiting by, and therefore sustaining, the many actual and relative advancements of civilization.

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[*] See an admirable essay, 'The Education of the World,' by F. Temple, D.D., Head Master of Rugby School. (Essays and Reviews. London, 1860.)

[†] Du Suicide, p. 84.

[‡] See Winslow's Anatomy of Suicide, and Quetelet's Statistique Morale. Both Esquirol and Calmeil have recorded some very remarkable cases of self-destruction in young children which illustrate the vanity and morbid sentimentalism of the French character. One child, thirteen years of age, says the former physician, hanged himself, leaving behind a written document commencing with these words—" Je légue mon âme à Rousseau, mon corps à la terre." (Des Maladies Mentales, vol. i. p. 588.)

> "Idiotcy, which is hereditarily leagued with the alcoholic tendencies of parents, presents a vast and complex field of study. My researches bearing upon this point coincide with those of authors who have remarked that degeneration of the species is more frequent in countries where fathers and mothers are addicted to habitual sottishness. In his statistics of the causes of insanity for the old kingdom of Westphalia, Dr. Ruer shows that idiotcy was very frequent among the mining population of that country. The sexual congress of the workmen, who live separate from their wives during the entire week, is ordinarily effected on their day of rest, when both sexes partake freely of stimulating beverages. I have remarked the same fact in those parts of France where drunkenness is equally common in men and women, and where children are begotten under the double influence of physical and moral evil. In the north of Europe these causes have exercised such ravages as to attract the just solicitude of the Government authorities." (Morel, p. 579.)

And there is a secret vice, unquestionably linked (strange as it may seem) with that emotional type of character which is most obnoxious to undue religious excitement, to which we are bound to allude, because we believe it to exercise a control not duly appreciated over the psychical condition of those in whom it is least suspected. Nor is this duty lessened by the fact that it is a matter of extreme difficulty to obtain accurate information concerning it. M. Morel is obviously aware of this difficulty; and we are disposed to think that he does not sufficiently connect with insanity, as a predisposing or exciting cause, the indulgence of the sexual passion through unsexual means. He regards it rather as an accompaniment and result of insanity, though he does not doubt that it is at times the causal phenomenon which conditions a proclivity to mental disease.

Guislain is much of the same opinion as Morel, but more clearly because he has a larger perception of the difficulty of obtaining correct evidence. Esquirol believed that masturbation played no mean part in the production of nervous depression, and affirmed that among the upper classes, in both sexes, it abundantly predisposed to alienation. It is certain that no vice is more easily initiated, because it is alike sustained and stimulated by erethism and curiosity; and it is equally certain no vice, when it has been fully established, is more difficult of suppression. "Impurity can outlive and kill a thousand virtues, it can corrupt the most generous heart, it can madden the soberest intellect, it can debase the loftiest imagination."* And this connexion with religion, and especially with an emotional and subjective religion, being borne out by the experience of most British and Continental observers, makes the fact more worthy of our attention; for however anomalous it may appear to be, there is really nothing remarkable about it; and it may be explained by the application of principles quite within the reach of ordinary reflection and observation. For a system which resists the natural laws of the economy, and subjects a man perpetually to an analysis of his own wretched individuality, and finds no outlet in the multiform duties of an active life, invariably results in, and is partly sustained by, a continuous erethism, which has an almost insuperable league with sensuality. This is one of the great objections to monastic seclusion; and there is little doubt that if conventual records could be fully disclosed, they would tell out trumpet-tongued of a most exalted pietism linked and clogged by indissoluble chains with the consummate nastiness of masturbation. "I could not say," observes M. Morel, "how frequently I have seen this pernicious habit existing in youths educated with the most pious sentiments; generally, however, endowed with a timid and retiring disposition." (p. 176.)

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* The Education of the World, by F. Temple, D.D., Head Master of Rugby School. (Essays and Reviews).

Nor is this *neuropathia psychica sexualis* confined to the masculine gender. It equally obtains in women; and, according to Guislain, finds its constant cure in "marriage and assafœtida." Dr. Lisle, while he admits that the theory which regards insanity as primarily and essentially of cerebral origin is so far true as to be axiomatic, affirms that masturbation proves more than any other vice that the disease *may* be of secondary and sympathetic growth. How little do those know of human nature, and of that perfection of character which is leagued with, and cannot be attained without, a measured indulgence in natural instincts, the lives and records of (what are called) the most saintly men have in some degree revealed to us. "Qui corpus suum continentiæ dedicat, habitare cum fœminis non presumat." Thus wrote Gregory the Great, so little acquainted with humanity as not to have learned that the "non habitans cum fœminis" involves, in a great majority of instances, the impossibility of a "corporis dedicatio continentiæ; and that "the angelic life" (as Isaac Taylor expresses it) is the rather perilled than ensured by a repudiation of the "conjugal economy." Equally ignorant of himself, and of Nature's wonderful provision for all her children, Isidore writes: "So far as possible, all converse with women is to be shunned; or, if this cannot altogether be avoided, they should be spoken with only, the eye fixed on the earth. . . . In the case of almost all who have fallen by their means, *death hath entered in by the windows!*" (Lib. i., epis. 67.)*

If there be any fact with the truth of which we are more fully convinced than with that of any other, within the blended range of the physiological and the psychical, it is that the sensuality of pietism (if we may so express ourselves) which permeates so many phases of monastic life, as evidenced by the stigmatic and mystic records, is conditioned by the violence done to natural laws, in the withdrawal from, and the suppression of, legitimate means by which to gratify physical instincts. Upon no other supposition can be explained the language so frequently made use of by "saints" of both sexes, in the shape of ecstatic ejaculations to, and ponderings upon, the Virgin Mother and the Saviour of mankind.* It finds literal expression, in obedience to a law which is not to be resisted by certain temperaments. Nature demands an outlet for craving instincts; she finds it not through legitimate channels, but through dark and dubious ones; and she revenges herself for the violence thus done to her, by the terrible retribution of mania or imbecility, or at least in the milder one of a purposeless, and therefore unsatisfying existence. To such an extent has this sensuality been carried by hysteric women, that they have imagined themselves in relations to the divine personality which are not to be thought of without horror and indignation. And M. Morel assures us that he has seen erotism, and even nymphomania, develope themselves in the most virtuous and chaste women, by reason of a continence forced upon them in obedience to the requirements of a (supposed) exalted piety.

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* Quoted by Isaac Taylor, in his very interesting and learned treatise on Fanaticism.

> "A hagiograph tells us that a virgin, St. Christine, Abbess of St. Benoit, believed that she was received as a veritable spouse in the couch of our Saviour. This delusion of an hysteric woman is seen in every page of the revelations of St. Gertrude; and St. Catherine de Sienne harps upon the same delusion."†

It is surely the duty of the physician to warn young girls of introverting and emotional tendencies, against the encouragement of that *surexcitation nerveuse* which leads by certain steps to a dangerous precipice, over which falling, they will find themselves in the restless gulf of ecstasy and mysticism.

> "L'extase est le fait psychique initial, fondamental du mysticisme. Toute doctrine mystique dérive d'un état extatique. Extase, dans le langage médical, est synonyme de phrénopathie ou maladie du cerveau, et aussi de névrose intellectuelle." (Moreau, p. 232.)

Nor should we overlook the circumstance (for it is a most instructive psycho-pathological fact) that in the most hopeless of cerebral diseases —the general paralysis of the insane—the periodic manifestation of *ecstatic* phenomena is one of its most remarkable characteristics.

It would be a curious and interesting study to ascertain how far the positive and negative evils of conventual seclusion, as relates to the practice of vices so constantly in companionship with religious sentiment, are counteracted by a withdrawal from the bustle of mankind, and from the many cares and responsibilities which have no footing in the chapel and the cell. Certain it is, that the violence done to natural laws by the prohibition of legitimate sexual gratification may produce extraordinary results in some subjects and temperaments. And many striking instances of the pernicious effects of a forced continence are recorded by Doctors Morel and Moreau. The latter dwells most forcibly upon the evils arising from the suppression of the instincts with which nature has endowed us.

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* "Oh, sweet Jesu," sang the sainted Bonaventura, with lips which have been silent for nearly six hundred years, "I knew not that thy kisses were so sweet, nor thy society so delectable, nor thy attraction so virtuous; for when I love thee I am clean, when I touch thee I am chaste, when I receive thee I am a virgin! Oh, most sweet Jesu, thy embraces defile not, but cleanse; thy attraction polluteth not, but sanctifieth. Oh, Jesu, the fountain of universal sweetness, pardon me that I believe so late that so much sweetness is in thy embraces!"

† The Ecstatic Mystics and Stigmatics, by M. Maurey; translated by J. H. Blount, M.B., &c. (See 'Journal of Mental Science,' vol. ii. p. 110.)

> "Everybody knows that continence, an excessive continence, may exercise deplorable influence upon the moral health, and give rise to mania, and even incurable dementia. Books which treat of insanity contain numerous histories testifying to this effect; and I could recal many similar facts observed by myself." (Moreau, p. 264.)

Again:

> "The sexual action, when a prolonged repose from its gratification, and the cumulative sensibility or nervous force resulting therefrom, have increased its intensity, may excite the cerebral organs to the exact point of disturbance which would be generated by too strong a dose of any stimulant." (p. 265.)

No one who has studied this question can doubt the truth of these opinions.

In the eighth chapter of the second book of his work, M. Morel treats of the correct mode of interpreting causal phenomena, and of basing upon them a sound classification of mental diseases. The causes which have generally been designated determining or accidental do not absolutely or necessarily provoke insanity. Those which are termed specific—some idiopathic cerebral affections, such as that which constitutes progressive paralysis—have alone the power of inevitably producing permanent lesion of the intellectual faculties, under certain determined conditions. Moreover, as regards the action of other causes, it is indispensable that there should be a *predisposition*, in order that the particular cause may act in a special manner. It is necessary that various elements, equally partaking of a physical and moral character, should be brought into play under the influence of predisposition, and concur with the accidental cause in the factorship of a particular form of mental alienation, which impresses common characteristics on all the insane attached to this exclusive type. Three elements, then, according to our author, are necessary to the realization of a particular type of mental disease: 1, *predisposition;* 2, *an accidental or exciting cause;* 3, *a functional disturbance or lesion.* If the predisposition does not exist, the accidental cause may indeed produce a disturbance of the intellectual or moral faculties; but rarely will it be of the precise character observed in the special and essential forms of the malady to which it assimilates itself. So that the affection will generally be acute, and the prognosis favourable. If, however, the effects are not transitory, but permanent, the disease becomes obedient to the fixed and invariable laws of its type.

> "We then designate the form of the insanity by the name of the accidental or determining cause; and immediately it becomes evident how many errors of diagnosis and prognosis are involved in such a mode of classification. For does not daily experience teach us that we are almost invariably led to attribute the

part played by the predisposing cause to that of the exciting cause, and thus neglect the real point of departure—the point, in fact, of that cause which gives to the disease its particular form—which does not permit of one variety being confounded with another, and the alienated belonging to one class being mixed up with those of another class?" (Morel, p. 251.)

The objections to the ordinary classifications of different authors arise from the fact that they are based upon *symptoms* and not upon *causes*; and so, diseases essentially different in their origin may be unscientifically grouped together, if they have (as frequently happens) even a small measure of common symptoms. M. Morel proposes, therefore,—

> "A classification of mental diseases where their nomenclature is not derived from a maximum or minimum of exaltation and depression, as in the terms *mania*, *melancholia*, *monomania*, *dementia*. These phenomena are symptoms found in every variety of insanity. My object is to find in every form the characteristics by which it is distinguished from other forms; so that the fundamental characteristics once laid down, we may recognise to what nosological variety belongs the patient who reveals himself to us by extravagant ideas or acts, and by various lesions or functional disturbance of the nervous system." (p. 258.)

And, according to our author, this principle of classification may be enforced even where we have such an extensive and almost unlimited field as that mapped out to us under the heading of "hereditary insanity." For that which is conveyed by direct seminal transmission has its essential characteristics; and the insane attached to this variety may be known by certain signs. They divide themselves even into many classes; and each class has its share of both external and internal symptoms. These symptoms characterize the individuals comprised under this variety; and the latter are subjected to cerebral disturbances which (so to speak) stereotype their delirium, and determine the nature of their acts. It is true that a crowd of blended physical and moral causes, such as venereal or nicotian excesses, functional derangement of the digestion or circulation, child-bearing or climacteric influences, the passion of love or grief, and many others, precipitate the evolution of delirious predispositions, in those grouped under this category, and complicate the simple progress of disease.

> "But these interwoven exciting causes do not rob the hereditarily insane of the mournful privilege of manifesting predisposing specialties, nor destroy that mode of action which is peculiar to what has been received by transmission. So that the form, the progress, the termination of the disease, have unmistakeable characteristics which denote its origin, and justify in all points that theory which establishes a form known as 'hereditary insanity.'" (p. 252.)

This principle, too, may be applied to other varieties distinguished by the denominations of hysterical, epileptic, or hypochondriacal, which most authors have incorrectly regarded as complications of that abstract entity termed insanity, rather than as generators of a particular form of mental disease. And if we examine that important class of maladies which has its connexion with idiopathic lesions of the brain, we observe the same law giving the weight of its authority in the production and manifestation of special extravagances due to this order of causation. What, for instance, do we remark in the progressive paralysis of the insane? An *ensemble* of phenomena identical in all who are afflicted with this fatal disease. It is always accompanied at its commencement by hesitation of speech. In the most advanced stages of the affection the power of moving the arms and legs is never entirely lost. It is marked by periods of remittance; and lastly, it is characterized by the most frantic and invariable delirium that it is possible to meet with. It constantly developes itself in those who have never been subjected to any of the deteriorating influences so fertile in generating disease; but it still bears the unmistakeable stamp with which no other form of insanity is stereotyped. And however much its origin and its progress may be complicated by mixed phenomena, it retains a distinct and peculiar entity.

CLASSIFICATION.

GROUP I.—Hereditary insanity, containing four classes. *Class* 1 comprises all those in whom a nervous temperament is a congenital fact, by virtue of extremely varied hereditary transmissions. *Class* 2 includes those in whom the hereditary impress discloses itself by intellectual phenomena of action rather than of words. They are eccentric, violent, irregular, and often profoundly immoral. Capable of achieving much, they achieve nothing, for they cannot co-ordinate their faculties to a wise and useful purpose. (*Monomania*, of some authors; *Moral Insanity*, of the English.) *Class* 3 forms the transition between individuals of the second category and those who have reached the lowest form of human degeneration—imbeciles, idiots, &c. The physical signs, such as vicious conformation of the head, smallness of body, sterility, or, at least in the generality of cases, a difficulty of propagation, are much more marked in subjects of this than the preceding class. *Class* 4, weak-minded persons, imbeciles, idiots.

GROUP II.—Insanity resulting from intoxication;* containing three classes. *Class* 1. Narcotic substances employed for the production of factitious sensations. The prejudicial influences of certain occupations. Exposure to these varied agents involves special symptoms, and leads to fatal results, in convulsions and paralysis. *Class* 2. The influence of an insufficient or deteriorated nourishment. General debility, scrofulous degeneration, and an increased liability to the scourge of nervous epidemics—Hysteria (?), "Revivalism" (?)—result from these causes. *Class* 3. Marshy influences. Geological structure of the soil, &c., as evidenced in cretinism.

GROUP III.—Insanity caused by the transformation of certain nervous affections; containing three classes. *Class* 1. Hysterical insanity. *Class* 2. Epileptic insanity. *Class* 3. Hypochondriacal insanity.

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* M. Morel uses this word in a very comprehensive, and not limited alcoholic sense. He says, if we examine the nature of functional disturbance or organic lesion produced by the same cause or the same order of causes, we see the frequent repetition of the same habit develope strictly identical symptoms. The lesions of the nervous system have a relationship to the nature of their exciting causes, which may have been alcohol, opium, lead and other metallic substances, ergot of rye, or marsh miasmata. All of these are poisons circulating in the system, and generate peculiar symptoms by a process of *intoxication*.

GROUP IV.—Idiopathic insanity; containing two classes. *Class* 1. Progressive enfeeblement or abolition of the intellectual faculties, consequent upon chronic disease of the brain or its membranes. *Class* 2. General paralysis—paralytic insanity—with a prevalence of extravagant notions during the paroxysms of maniacal excitement (*délire ambitieux—délire systematique des grandeurs*).

GROUP V.—Sympathetic insanity; comprising those forms which are the consequence of disturbances or primary and special lesions of the organism—those, in short, *in which the brain is the seat of the insanity, but not the seat of the cause* (*erotomania, nymphomania, &c.*).

GROUP VI.—Dementia (strictly speaking, a terminative and not a primordial form).

Whatever may be the objections to this ingenious classification, it must be admitted that it is based upon sound and scientific principles; for it deals with causality, and not with symptomatology, and so enables the physician to formulate curative and preventive measures with greater precision and certainty. The chief difficulties which present themselves to its adoption would appear to arise from the impossibility of always fathoming the causal phenomena, whilst the symptomatic ones are always before us—from the difficulty, in fact (by no means unfrequent), of making ourselves acquainted with the antecedents of the patient and his family. Certainly, the symptoms do not always reveal the early history of the disease, even to the acutest observer.

M. Morel, however, does not pretend that this is a perfect classification. He only thinks (and so far we quite agree with him) it is founded upon principles which can alone ensure ultimately a perfect one: a development which we may hope for as we become better acquainted with the etiology of insanity, and with the antagonizing complexities of causation.

> "I am far from pretending that the classification which I propose excludes for ever the possibility of any other special form of insanity. On the contrary, I believe that once embarked on the path which co-ordinates pathological phenomena, other causes of insanity will yet be found to impress common characteristics upon those who are obnoxious to their influence. If for an instant I was tempted to make any *physiological* exception to this law of identity, it would be in favour of *puerperal mania*: if any *moral* exception, it would be respecting the alienation resulting from *love* and from *religion*. Nevertheless, as regards the former, observation has already taught us that the cerebral disturbance which it produces has not strictly identical characteristics in every individual, during its development or (especially) its termination. The prognosis varies extremely, according to the predisposition of the patient. The same may be affirmed of the two forms of moral insanity just indicated, although love and religion, those two feelings which involve the most powerful interests of the human mind, may naturally produce, when their action is absolutely independent, insanity of defined and well-marked features. But once more, the path being open, I shall be the first to applaud the efforts of others to expand it, and I shall cordially accept fresh varieties of insanity which may be thought worthy of a distinct place in classification." (p. 270.)

If our real knowledge of disease, and our prospect of rendering it yet more cumulative, are proportioned to our acquaintance with its etiology, with the influence of predisposition, and with the legitimate connexion between certain sequences and certain antecedents, in the relationship of cause and effect, it is obvious that we have already dealt with the most important part of M. Morel's elaborate psychological treatise. Our space forbids us to do more than allude to a few additional details. The opinion seems to be gaining ground in France, that a more abundant influence than formerly is now exercised by degeneration of the species, in the factorship of insanity. And M. Morel assures us that the mortality of the insane is swayed in a remarkable manner by the increase of idiopathic cerebral affections, though it is difficult to make any approximation to statistical accuracy with respect to this fact. We believe that the experience of British physicians confirms this position. One thing is certain: that the mortality is greater among the insane than the sane. Dr. Farr puts this matter beyond all question as regards this country; but the relative mortality is far less than it used to be under the old system of depletion and cruelty.

> "The Registrar-General's Report for 1854 gives the mortality of England and Wales, for the preceding seventeen years, at 2·24 per cent. for all ages. Now in every asylum for the insane, whether at home or abroad, statistics of which are published, the rate of mortality is very much higher. To confine ourselves to our own country: in the Norfolk asylum, during five years, 19·1; in the Wakefield, 15·73; at Bethlem, 7·08; and at the York Retreat, where the mortality has been low, it is about double—namely, 5·06."*

In the Report issued by Dr. Hood, at Bethlem Hospital, for 1858, he says: "The deaths during the year have not differed from the usual average." (p. 39.)

Our reminiscences of the treatment of disease in French hospitals do not make us estimate it so highly as that quickness of perception which leads our neighbours to a speedy and accurate diagnosis. M. Morel, however, seems to be equal to his times. He is a great advocate for warm baths and cold affusions—to the efficacy of which every alienist physician can testify. Hysteria and hypochondriasis he assails with liquid streams, rather than with opiates, or antispasmodics, or purgation. In the treatment of the former disease (unaccompanied by insanity), magnetism, which failed in the hands of Esquirol, is powerful for good in those of his modern disciples—Drs. Saint Evron, Blanche, Desbois, Despréaux, Védic, and Morel. The latter has a high opinion of belladonna in the treatment of epileptic and hysterico-epileptic insanity. In a monograph upon this subject by Dr. Girard de Cailleux it is strongly recommended, though its exhibition requires great caution, as many cases are not suited for it.

> "That form of disease to which it is best adapted is where there is a predominance of maniacal excitement, violence, and illusions or hallucinations, however great may be the violence of the tonic or clonic convulsions. If, on

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* Psychological Medicine, by Drs. Bucknill and Tuke, p. 268.

the contrary, there is an excess of stupor or vertigo, or if the disease simply consists of epileptic vertigo, preference should be given to aconite."

The valerianate of atropine has been equally vaunted with belladonna; but MM. Morel and Dobreyne are more satisfied with the effects of the latter, as the compound alkaloid appears to produce dryness of the throat and fauces. Dr. Girard de Cailleux says of belladonna:

> "In order to obtain satisfactory results, gradually-increasing doses must be employed, and for a considerable period, beginning with from the ·025 to the ·05 of a gramme (⅜ths to ¾ths of a grain), according to the age and constitution of the patient; and increasing the dose every month by the ·01 of a gramme ($\frac{3}{20}$ths of a grain) to the ·05 of a gramme (¾ths of a grain), varying with the progress of the case and the number of fits. Having reached the daily dose of ·50, ·75 of a gramme (7½ to 11¼ grains), or even one gramme (15½ grains nearly), the administration of that quantity must be maintained for a certain period.* If the malady yields progressively, diminish the dose to the quantity with which treatment commenced. If the fits diminish in number and intensity, the patient remains at the minimum dose; if, however, they are not modified, the dose must gradually be re-augmented to the attainment of the maximum quantity."

It is right to conclude that as only one allusion is made by our author to restraint, in the treatment and management of his patients, they are under that rule which overshadows with beneficent protection the insane of this country. That single allusion is conveyed in the following expression: "Avec complication d'une manie furieuse qui necessitait l'emploi fréquent de la camisole de force." (p. 176.)

We take leave of M. Morel by referring to a subject in which the alienist physician has a peculiar interest, and we quote our author's own opinion thereupon. He says:

> "Persons who visit our asylums for the first time are certain to inquire if those attached to our official staff, and called upon to devote themselves constantly to the service of the insane, do not suffer from such communication and contact. I have no desire to exaggerate this danger; but I am persuaded that a residence in *maisons de santé* and asylums acts in a fatal manner upon the nervous system of many officers, and that it is not possible for every one to bear the constant sight of so much physical and moral wretchedness. My experience supplies most painful memories to this effect. Undoubtedly it may be objected that the administrative anxieties and responsibilities to which many of my *confrères* have been subjected should be allowed to have exercised some influence in determining the causality which made them the victims of insanity. But it is not less certain that the constant surroundings of hospital life have an abundant power over the manifestation of pathological phenomena." (p. 245.)

It is our desire that our illustrious neighbour may not in any sense be deteriorated by the cares through which he has passed and the triumphs which he has achieved, but that he may be spared to give us, in its most complete form, that literary offspring of which he has given us the promise, as a treatise on the 'Medical Jurisprudence of Psychology.'

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* These doses appear to us to be very large; but the tolerance of this narcotic poison by young children has been remarkably demonstrated by Dr. Fuller of St. George's Hospital. He has given as much as seventy grains daily in a case of chorea, without the production of any feverishness or other appreciable disturbance. Atropine was detected in the urine. Children bear larger doses than adults. We are not acquainted with any remedy (save nitric acid in large doses) equal to belladonna, in the treatment of whooping-cough.

Our attention is now invited to a work of a very different stamp to that which we have just considered. We have no longer to deal with the practical, but with the theoretical. We escape from the terrible realities of experience, from the "petrifying traditions" of earlier times, and, unfettered by the "formulæ of past thinkings," we are brought to the exploration of an almost new and untrodden country. We shall "tickle it with the hoe" of inquiry; it will "laugh with the harvest" of discovery. It matters not that we are at first surrounded by the atmosphere of doubt and hesitation. The progressive revelations which science has made in every age have been hampered by unexpansive minds, and clogged by unbelieving natures. Novelty is heresy; philosophic suggestions are infidel principles. Yet science lingers not in her course, and confesses with shame how little she has yet taught us. What a field of things *to be* discovered lies beyond the field which we *have* discovered! "Je vois marcher l'aiguille du cadran, et se placer sur l'heure. Quel est le mécanisme intime qui la guide? Nul ne le dit." Well may M. Moreau precede his treatise on the connexion between morbid psychology and the philosophy of history by this beautiful motto:

> "The mental characteristics which distinguish one man from another, by the originality of his thoughts and conceptions, by his eccentricity, by the energy of his affective or by the transcendancy of his intellectual faculties, have their origin in the same organic conditions as the various moral disturbances of which insanity and idiotcy are the most complete expression."

Such is the "argument" with which we have to deal—such the comprehensive problem submitted to our examination. We demand for it the most careful study; for we can assure our readers, in the author's own language, that this treatise is published in the hope of elucidating certain psychological questions which scholastic philosophy, with all its subtleties and hypotheses, has not yet resolved, and with a view to the exposure of the emptiness of certain doctrines against which every right mind has an instinctive tendency to revolt, but which it nevertheless embraces, because it has not yet learned to make use of those weapons which science has placed at its disposal. We are fearful of antagonizing tradition with the teachings of modern times; and the creature of self-satisfaction inquires, not "is such a thing true?" but, "has it a certain tendency?"—as though truth could be affected by considerations of this kind. The endeavour to trace the connexion between the mind and its material organ has at all times been assailed by the shafts of narrow-minded ignorance. There could scarcely be more reasonable grounds for these assaults if the object of psychological study was to draw any conclusions relative to the essence of psychical phenomena. Such, however, is not its object. We seek only to investigate the nature of the link between the body and the mind; we have nothing to do with the latter as a simple indivisible abstraction; we touch not upon the "philosophy of the unconditioned." "Dieu et l'âme" says M. Marchal de Calvi, "sont questions réservées;" and we dare not "livrer le nom de Dieu aux vicissitudes de la discussion scientifique." We do but strive to trace to principles regulated by an undeviating law the relative bearings of the two constituents which make up the human personality—a personality which, without the immaterial principle, would be less than man; without the material vestment, would be more than man; but which, by the wonderful conjunction of the two, establishes the undoubted fact of humanity. "Toute l'alliance de l'esprit et du corps qui nous est connue, consiste dans une correspondance naturelle et mutuelle des pensées de l'âme avec les traces du cerveau, et des émotions de l'âme avec les mouvements des esprits animaux."[*]

If the intellectual and moral faculties yield us their only manifestation through the medium of a certain organ or system of organs, it is reasonable to conclude that our researches for determining the laws which regulate the former must be addressed primarily to the latter. And if any science is eventually to elucidate what no system of philosophy has yet succeeded in doing, it is that of psychology. With what special conditions, then, of the organism must we connect the various forms and modes of psychical activity? Not (says M. Moreau) to size and weight, or to the cranial prominences whose geography constitutes the science of phrenology. He would like to take those who believe in such a notion under the cupola of the Institute of France, and demonstrate how exactly similar is the configuration of the learned heads there assembled to those of thousands who have never had, and never will have, the least pretension to celebrity. Dr. Prichard believes, as is well known, that Englishmen have "much more capacious brain-cases than their forefathers;"[†] in other words, that cerebral development is, in some sense, a measure of civilization. And the general belief is certainly to the effect that intellectual superiority is allied with a particular type of conformation. Our author, however, believes only *to a certain extent*, with Réveillé-Parise, that "the sphere of the brain determines the sphere of the intelligence," and that a *monstrum in fronte* (that is, one who has a low and compressed forehead) is a *monstrum in animo*. "It is a pathological fact observed among all races, from the least to the most highly civilized, that idiots, and even imbeciles, have a more or less narrow and contracted cranium." (Moreau, p. 23.) So far, so good. But if it be true (as we believe it is) that the generality of commonplace humanities are exactly similar as regards cerebral development (relative size and weight) to those of the most highly gifted persons, it is obvious that the power of the thinking principle depends upon some other material properties. Yet the microscope reveals nothing respecting variety of structure. The cerebral tissues of the insane are precisely as those who are sane. "A large number of brains," says Dr. Bucknill, "we have diligently investigated with a first-rate microscope.

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[*] Malebranche: De la Recherche de la Verité, liv. ii. p. 293.

[†] See Prichard's Physical History of Mankind, vol. i. p. 305.

The results appear to have afforded no distinction between the sane and the insane brain."* We have got farther, then, to travel on our voyage of discovery: "il faut pénétrer plus avant encore dans l'enveloppe matérielle, jusqu'à ces limites où la matière est, pour ainsi dire, près de vous échapper, et où vous touchez déjà à l'ésprit." And by a path at once the most natural and the most logical, we are led into a land of scientific promise, flowing with the milk and honey of PREDISPOSITION. In that physio-pathological condition of the vital organism, and not in a minute structural arrangement (capable of analysis) of the more plastic and mortal part of us, lies the solution of the curious problem of mental inequalities and differential characteristics. In that state, when implicating the nervous system, lies concealed the primordial power and generator of those idiogenic phenomena which we are now considering, and of which insanity and idiotcy express the highest degree of development.

It behoves us, however, first of all, to establish that every nervous affection is identical in its essential nature with those cerebral disturbances of which the diseases just indicated comprise an innumerable variety of symptoms. Insanity must be regarded as a sort of erethism, an accumulation, as it were, of cerebral nervous force, from which the smallest spark (accidental cause) may at any moment derive all the constitutional phenomena of some form or other of that disease. Various physiological and psychical facts prove this to be a perfectly legitimate assumption. 1. *Physiological.*—*a.* Certain modifications of sensibility precede the invasion of insanity, and constitute its initial phase—nervo-congestive, resembling sanguino-congestive, symptoms. *b.* Nervous symptoms, strictly analogous and even identical with the phenomena known as *auras.* *c.* Slight convulsive symptoms—a species of electric shock—similar to those which precede the most severe forms of nervous maladies. *d.* A state of simple nervous excitement. *e.* Various disturbances, commonly known as *vertigos, syncopes,* &c. These multiform symptoms impress many who experience them with a presentiment of the terrible affliction awaiting them, of which circumstance M. Moreau records many remarkable illustrative instances. 2. *Psychical.*—*a.* The existence of that comprehensive condition recognised as one of *general excitement.* It includes sleeplessness, incoherence of ideas, restlessness, &c., and "marks the commencement of every intellectual disorder, whatever may be its cause, and whatever form it may ultimately assume." *b.* Depression of physical and moral energy (secondary effects, under which are concealed essentially opposite mental characteristics).

By its origin, by the nature of its predisposing causes, and by its psychical and somatic landmarks, idiotcy may be assimilated to insanity; it leads to the same psychological consequences. The "scrofulo-rachitic" constitution dominates in the unhappy victims of this disease, and therefore allies it to our subject. Moreover, by itself, and insulated from every nervopathic element, it has many points of resemblance with the idiotic diathesis. Combined with that element, it acquires a relative importance superior to that of insanity itself. And all scrofulous affections, according to Lugol, are strictly identical in their nature, and depend upon inequality of nutrition. "Essentiam (hujus morbi) tantùm consistere in illâ nutritionis depravatione, per quam quædam partes nimiò gravantur nutrimento, hinc mole augeantur nimis, aliæ verò tantò nimis deficiant."[*] From the most carefully conducted examination, then, of the physical and psychical characteristics appertaining to scrofula and rachitis, it results (according to M. Moreau) that those who are obnoxious to such deteriorations are organized precisely as the insane. "Aliénés, idiots, scrofuleux et rachitiques, en vertu de leur commune origine, de certains caractères physiques et moraux, doivent être considérés comme les enfants d'une même famille, les rameaux divers d'un même tronc." (p. 99.)

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* Psychological Medicine, by Drs. Bucknill and Tuke, p. 446.

We now arrive at the influence exercised by the above-named pathological states upon the intellectual functions. What are the laws in virtue of which this influence is brought into play? They are two—the *hereditary* and the *innate*. "The unity of life" has a double manifestation—the *physique* and the *moral*. Both are capable of seminal transmission; and as "une névrosité morbidement exaltée" may be handed down from one generation to another, so it may arise spontaneously in any individual, and then condition the future of his descendants. The hereditary law, the law of transmission, is to be understood, both generally and pathologically, as implying a propagation of continuous similarity—a process of sustained imitation. And the organ, or system of organs, in which is once deposited an unhealthy germ, must be regarded as essentially abnormal. Hereditary predisposition then becomes, both functionally and organically, *a veritable lesion*, having either a physical or moral development. It impresses its seal upon every form of mental power, and every manifestation of the thinking faculty, from the most elementary to the most transcendant. And we see handed down, from father to son, particular characteristics—the same type of intellect, thoughts, tastes, passions, habits, undergoing (it may be great, or scarcely any) modification.[†] If we study the hereditary law in itself, we see that the intellectual disturbances of descendants are produced by disorders of the same nature, in those from whom the descendants spring, and that they may often be either of the maternal or paternal type, or partaking of both characters. That they are produced by simple anomalies of innervation; by marriages contracted in violation of the laws of a healthy physiology; and by a special organization peculiar to various members of the same family. Those who are prone (as many are) to exaggerate the power of free-will, will deny these verities, overlooking the fact that under the menace of disease and the reality of predisposition the organism may be incessantly struggling in a vortex of opposing influences, and at last driven to the surrender of its citadel to an enemy whose name is feebleness, but whose power is strength. "Who will dare to affirm (indignantly exclaims M. Moreau) that an individual predestined* to insanity—that is, to a mental state which is the negation of free-will—is in possession of an amount of volition sufficient for the purposes of withstanding the coercings and enticements which have their source in an exceptional and morbid organization?" (p. 134.)

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[*] Van Swieten, vol. v. § 1485.

[†] It is curious how so great a thinker as Mr. Buckle should be unable to appropriate this generally received and well-attested opiuion. He affirms that we know nothing of the circumstances which regulate the hereditary transmission of character, temperament, &c., and the differences met with do not arise from the influence of this law, or from a difference of cerebral conformation, but rather from (what he terms) "a progress of opportunity." We are all alike, being (as Locke expresses it) "much the same for natural endowments in all times." "We often hear (remarks Mr. Buckle) of hereditary talents, hereditary vices, and hereditary virtues; but whoever will critically examine the evidence will find that we have no proof of their existence." He particularly cautions us against "receiving statements which positively affirm the existence of hereditary madness." ('History of Civilization in England,' p. 161.) M. Moreau, on the contrary, says—"L'hérédité est la source des neuf-dixièmes, peut-être, des maladies mentales." Dr. Burrows puts the figure at six-sevenths. Esquirol, Guislain, Morel, Jacobi, Michéa, Parchappe, Conolly, Sutherland, Thurnam, Webster, Bucknill, all believe in the influence of the hereditary law. It is a fact impressed upon us by the most overpowering evidence.

The principal modes in which the hereditary influence manifests itself are—1st, by a pure and simple transmission of insanity from parents to children. And this transmitted insanity (Esquirol long since remarked) may be developed at the same period of life, be provoked by the same causes, and affect the same character. A suicidal tendency may even force its victim to the same means of self-destruction. 2ndly. The morbid state may not be handed down in its entirety, but partially. The descendants of an insane person, without being precisely alienated, present, in a moral aspect, a resemblance more or less complete to those who have begotten them. And, 3rdly, *vice-versâ*, a state of half-insanity or eccentricity in parents may become, in their offspring, the source of veritable insanity. Eccentricity and insanity, indeed, are two pathological states having a common origin. The children of these persons (often extremely precocious) live, for the more part, but a short period, dying of convulsions or some other cerebral affection. It is probable, indeed, that of the thousands of children who die annually of brain-disease during the first few years of life, the great majority would have lived only to perpetuate insanity.† "Whom the gods love die young."

From the above considerations it follows that persons born with hereditary predispositions involving the general nervous system, are in quite an exceptional condition as regards their mental power, and that it is quite impossible to appreciate with any approach to accuracy the psychical state of children, without reference to that of their parents. But the modification of the mental faculties is also allied with pathological conditions peculiar to the constitution, to the idiosyncrasy of the individual. These conditions are—first, a general nervopathic state; second, a hypochondriacal constitution; third, a constitution termed paralytic. The unhappy subjects of the latter class are known by a psychical attitude as remarkable and as special as the organic lesions which accompany it.

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* It is obvious that this word is not used in a narrow theological, but in a large and scientific, sense. The favourite word of Sir William Hamilton and Professor Mansel—"conditioned"—would be more appropriate, seeing how liable—not to say how eager—some persons are to misconstrue and misrepresent.

† M. Moreau records some very remarkable instances of infantile mortality in the descendants of epileptics.

The result of the combined influence of the hereditary law and a purely nervous idiosyncrasy upon the moral and intelligential faculties, is a host of humanities known as intellectually gifted, inconsistent, and, in certain respects, not only eccentric and displaying striking *bizarreries* of character, but positively deranged. "They are cracked, but the crack lets in the light." The line of demarcation is here most difficult to trace between the phenomena of health and disease; and the conclusions of to-day respecting such patients are not unfrequently dispelled by the doubts and uncertainties of to-morrow. No one has treated of this class of persons more ably than Dr. Conolly, in that earlier work of his which initiated his celebrity as an alienist physician.* And these influences may confine themselves to the intelligential faculties, or to the emotional (affective) dispositions. They constitute a sort of mixed state of insanity and superior power. Under the former or intelligential category are comprised oddities, theosophs, mystics, ecstatics, visionaries, eccentric and unequal characters. Thus are bound up together in the same nature things which seem to be incompatible. Thus the same mind is peopled at once with the most sublime conceptions, and ideas really and pathologically extravagant.

> "And, in fact, is it not strange, in the eyes at least of those who have not fathomed the mysteries of morbid psychology, that even as the precious metals are only met with enveloped in poor and worthless alloys, so the thoughts and conceptions which attest the greatest energy and the most abundant intellectuality are generated in cerebral organs where reign likewise confusion and disorder? How many inventions and discoveries in arts, and sciences, and industrial occupations, have germinated in (what are vulgarly but strikingly termed) 'cracked brains,' and have at first remained unnoticed, or been treated even with the most profound disdain, as much because of the mental condition of their authors, as because the brilliancy of those discoveries themselves was too far in advance of present and immediate knowledge! These psychological phenomena, we repeat, are chiefly observed in men devoted to the study of theology and moral philosophy, to the sciences which treat of the relations between God and humanity, and which have for their direct and immediate object the destinies of man here below, his rights, his duties, his hopes, the means of ameliorating the lot of those who suffer—studies which are nurtured by and involve the development of the profoundest sensibility and the most ardent emotions." (Moreau, pp. 217-18.)

What has been said of the influence of nervopathic states upon the intelligential is equally applicable to the affective faculties—to that "*virtualité de l'âme humaine*" which is the source of our emotions, our instincts, our desires, and in part also of the will; by which we love or hate, are inclined towards good or evil, are led to be useful or injurious to our fellow-creatures, and fulfil or infringe the requirements of absolute or conventional duty. The differences observed in the affective dispositions are indeed endless, and the changes and modifications which they experience are such as are not solved by a reference to education or to human or comparative physiology. How, then, are they to be explained? "*Le fait d'hérédité donne seul la solution du problème*," and must be studied both in its normal and abnormal aspect. There is no doubt that the connexion between our passions and our material organization is much more intimate than is generally supposed, as may be proved by a reference to that most imperious and idealized of all—the passion of *love*.* "Les émotions agréables ou desagréables," says Broussais, "qui accompagnent nos perceptions, viennent toujours d'une stimulation de l'appareil nerveux du percevant."† And these organisms, and the instincts depending on them, are reproduced and perpetuated from one generation to another.

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* An Enquiry, &c., see the chapter on Inequalities, Weaknesses, and Peculiarities of the Human Understanding which do not amount to Insanity.

> "Is there," says M. Moreau, "in the eyes of the physiologist, of any one who has studied never so little the laws of our organizations, anything more obvious and more clearly developed, than the truth contained in the following proposition? The principle or passion of love, in every form and under every aspiration, is based upon the reciprocal action of our instincts and our intellects, our intellects and our instincts—in other words, upon the reciprocal action between the organs in which some authors have placed a *sixth sense*, and the brain, between the brain and those organs." (p. 282.)

We think that physiology and pathology alike attest the justice of this opinion,‡ and seem to bear out the declaration of Zimmermann, that the passion which has been baptized with the beautiful name of love is no more a passion than hunger or thirst, and all those other sensuous appetites which tend naturally to our well-being and preservation. Burke also is clearly of this opinion. In his 'Essay on the Sublime and Beautiful,' he attributes love to a "relaxation somewhat below the natural tone" of "the solids of the whole system."

> "Once more," says a modern author, "everything which passes in the mind is allied with some corporeal modification. The organic acts are determined one by the other, in an unfailing and indissoluble *solidarité*. Spirit is not on that account matter, nor matter spirit, but the two factors, although logically distinct, are blended together and identified in the indivisible *Unity of Life*. This is the explanation of the fact that *haschisch* introduced *into the body* produces *upon the spirit* the same exhilarating effects as good news, and reciprocally, bad news *communicated to the spirit* may mortally *affect the body*, as a dose of hydrocyanic acid."§

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* We may remind our readers that a great French ecclesiastic (Bossuet), whose profession forbade his realization of this passion in its highest and most complete form, regarded all other passions as springing directly from it, and being subordinate to it. "La haine qu'on a pour un objet, ne vient que de l'amour qu'on a pour un autre. Le désir n'est qu'un amour qui s'étend au bien qu'il n'a pas, comme la joie est un amour qui entreprend ce qu'il y a de plus difficile pour posséder l'objet aimé; l'espérance est un amour qui se flatte de posséder cet objet, et le désespoir un amour désolé de s'en voir privé à jamais; la colère est un amour irrité de ce qu'on veut lui ôter son bien, et qui s'efforce de le defendre. Enfin, ôtez l'amour, il n'y a plus de passions, et posez l'amour, vous les faites renâitre toutes."

† De l'Irritation et de la Folie, p. 207. Paris, 1828.

‡ And surely this proposition is supported and illustrated by the allusions made in a former portion of this article to the mysteries of conventual life; where we have seen the entire character of the most exalted piety coerced, as it were, into sensuality, by that excessive nervous force which gradually accumulates in the brain by "un repos trop prolongé de l'action sexuelle." "Chi vive più castamente è più sotto-posto all' amore."

§ La Médecine et les Médecins, par Louis Peisse, p. 27. Paris, 1857.

Seeing, then, by how many links our organisms and our affective dispositions are bound together, there can be no difficulty in admitting that both alike may be handed down from one individual to another, by the path of seminal transmission. Our daily observation points out to us that children are the duplicates of one or both parents, and that they inherit from their progenitors that "forme sensitive de l'âme qui embrasse toute la sphère de l'activité pathétique de l'être, tous ses types d'impression, d'impulsion, et d'état, sentiments, goûts, penchants, qualités, passions."* And if the inheritance of the affective dispositions cannot be questioned in reference to their physiological, neither can they be as regards their pathological bearing. For insanity, in its absolute sense, naturally implies lesion of the affective faculties (*moral insanity* of Dr. Prichard; *emotional insanity* of Dr. Noble), as also of the intellectual, the hereditary nature of which has been already demonstrated.

Under the influence of nervopathic predispositions, the affections are most precocious in some children, and the intellectual parts in others. By this inequality, where the preponderance is to the former, young persons at times acquire a frightful development of their passions, of which M. Moreau records some very remarkable instances. This influence conditions a proclivity to fanaticism and crime, and especially to prostitution. When the weight of nervopathic predisposition inclines towards the intellectual scale, the precociousness, while it enables its inheritor to achieve more than other children, involves the certainty of his doing hereafter far less than other men whose intellectual power had been more equably developed.

We come now, in conclusion, to the most interesting portion of this remarkable treatise—the organic conditions appertaining to pre-eminence of the intellectual faculties. Having studied the mixed intelligential and affective states, and the strange dispositions of the thinking faculty resulting from them, we have to inquire what influence is exercised by nervopathic conditions upon the higher forms of intellectuality; and whether the latter do not find in the former the realities most favourable and most necessary to their development. It has been shown that under whatever shapes diseases implicating the nervous system manifest themselves—acute or chronic, general or partial delirium, idiotcy, rachitis, scrofula, epilepsy, hysteria, &c.—there is always an exaltation of vital properties, *an excess of life.* What appears to be feebleness is only a defect of mental co-ordination. It is perversion of power, and not diminution of power.† From this it results that a *nervopathic* state necessarily brings with it into the organism a new element of life, and gives an unaccustomed impulse to the machinery charged with the manifestation of nervous force; hence unusual activity of mind when the intellectual apparatus is more particularly affected, unusual activity of motor power when the muscular apparatus is involved. When this *suractivité* is carried beyond a point compatible with the due exercise of the laws of the economy, *insanity* is developed in the former case, and *convulsions* in the latter.

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* De l'Hérédité Naturelle, par P. Lucas, t. i. p. 484. (Quoted by Moreau.)

† M. Moreau dwells very forcibly upon this point, because, he says, appearances would seem to indicate very much the contrary, especially in such diseases as dementia (which is only, however, strictly speaking, a *terminative* form of disease). The phenomena here manifested, indeed, he affirms to be most certain possible indications of that excess of vitality which has existed since the commencement of the malady—an excess which has ended by breaking the wheel-work of the machinery, as too great a tension of a spring leads to its forcible rupture. We give in his own language a note in which he reiterates this position:—'Nous avons fortement à cœur de détruire la conviction erronée où l'on est généralement, où sont plus que d'autres, peut-être, les savants qui ont beaucoup étudié l'homme moral, mais peu au point l'homme physique, que l'idée-folie implique nécessaire-

A new horizon here bounds our mental vision, the landscape becomes more varied, and we have pointed out to us the connexion, the hereditary correlation, of the most extreme conditions in which the human mind can find itself—insanity, and the loftiest intellectual endowment. We are shown a genealogical tree on which hang, side by side, the fruit of good and evil; and we are instructed that there is no contradiction of terms in the affirmation that disturbance of the intelligential faculties may become, by the path of seminal transmission, the source of a mental state regarded as essentially antipodal—"que le délire et le génie ont de communes racines." Remembering what has been said of the physical and psychical characters of alienation, and of every nervous disorder in general, of the excessive functional activity which they necessarily entail, and of which delirium, ideological exaltation, and incoherence, capriciousness and emotional violence, are the external reflection, we understand how the assimilation (in respect of origin and physiological *substratum*) of insanity and the highest intellectuality is not only legitimate but inevitable. This verity, then, is the cornerstone of our position. Insanity is mental over-activity, and consequently, this over-activity involves *désagrégation*—incoherence of ideas (*mania*)—sometimes an abnormal cohesion of the same ideas (*monomania*). In lessening this activity, in breaking this cohesion, or in co-ordinating this incoherence, reason is reconstructed and volition restored. We have to suppress, to modify, to substitute. It can be conceived, then, that the organic conditions most favourable to the development of the faculties are precisely those which give birth to insanity. From the unusual accumulation of vital force in an organ, two things are equally possible—greater energy in the functions of that organ, and (consequently) greater chances of morbid action of those same functions.

"One of the most conclusive proofs of the justice of this opinion is the following fact: Inspiration—that state in which intellectual power reaches its zenith, and which shed such brilliancy around the subject of it that ancient philosophy attributed its origin even to Divinity itself[*]—is precisely that condition which presents the greatest analogy with real insanity. Here, in fact, insanity and genius are all but synonymous, by force of their approximation and confusion."[†] (Moreau, pp. 367–68.)

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ment celle de faiblesse, d'impuissance, au physique et au moral; au moral surtout. Encore une fois, c'est tout le contraire, et nous tenons à ce que l'on se persuade bien que lorsque nous parlons de surexcitation, nous l'entendons aussi bien du moral que du physique, car nous ne séparons jamais l'un de l'autre." (p. 384.)

[*] "Quamdiu quis mente valet (says Plato) neque fingere carmina, neque dare oracula quisquam potest. . . . . Non enim arte, sed *divinâ vi* hæc dicunt." See also Cælius Aurelianus, De Furore.

[†] A great poet, according to Plato, could not compose before feeling himself filled, as it

So, too, what is termed enthusiasm is a sort of mental erethism, which transports the faculties beyond their legitimate sphere, and involves troublous consequences. A further development of it is maniacal excitement, a want of co-ordinating power, a surrender of volition. "In fact, let any one compare the circumstances which precede, accompany, or follow maniacal excitement, and the phenomena of inspiration, poetic or religious enthusiasm, and he will find between them the most striking similitude." (Moreau, p. 391.) And if we take account of the real nature of that particular organic state which is termed hereditary predisposition, we are at once arrested by the thought that this state represents, as it were in embryo, the very disease of whose maturity it is too often the fatal precursor. In this thought, too, is involved another—the existence of that *surexcitation*, an increase of vitality in the system of organs charged with the manifestation of nervous force. This *surexcitation*, to the eye of the pathologist who has minutely studied this comprehensive subject, is unquestionably the first phase or period of the disease, from whatever source that disease proceeds—either by deleterious agents introduced into the economy, or by principles spontaneously developed in the animal tissues. Placed in these peculiar circumstances, the organs necessarily exercise their functions under an influence foreign to their ordinary conditions. They are as a steam-engine at its highest pressure. If the thinking faculty is involved in this over-excitement, the mind has a greater rapidity of conception, of association of ideas; there is more originality, and quickness of memory, and imaginative power; the instincts, too, and the affections are endued with greater energy. Here, indeed, is intellectual development which may achieve, according to individual tastes and tendencies, every variety of conquest.

> "But if," says our author, "it passes certain limits; if by the violence of its action it masters the volition (*elle domine le moi*)—that is, the inner principle destined to bind together and co-ordinate the various intelligential powers—instead of enhancing the value of the mental qualities, by giving to them an unwonted brilliancy, it conducts directly to insanity." (p. 398.)

Under this view it will be acknowledged that cerebral disturbances are an hereditary condition peculiarly favourable to the development of the intellectual faculties. Moreover, beside the hereditary influence, there are certain moral and physical causes which woo the development of the intelligence, and excite it to activity. Of the moral causes, those which unduly stimulate the emotional or affective nature may equally work upon the intellectual; and, passing certain prescribed

were, with divinity, and *transported out of himself*, without, in fact, *losing his reason*. Great musicians do not compose while they are calm and sedate, but they are carried by a sort of harmonious coercion into a state of "fureur comme des bacchantes." There are numberless facts on record in reference to the eccentricities of great men, showing the necessity of odd and whimsical surroundings, to condition that state of enthusiasm or inspiration from whose periodicity they have attained their celebrity. Dr. Conolly has given many such in that earlier work of his to which we have before alluded. In this category are comprised Haydn, Handel, Mozart, Gluck, Sacchini, Sterne, Donizetti, Schiller, Guido-Reni, &c. These incidents illustrate (as Esquirol expresses it) "cette espece d'état cataleptique de la pensée" which isolates the man of genius from his fellow-man, and constitutes "le cachet, le signe pathognomonique des idées fixes."

limits, attain a delirious consummation. The prolonged sustentation of any fixed idea may condition a sort of general anæsthesia, and by a concentration of sensibility in the nervous centres, generate irresistible impulses. The physical causes are many. Tea, coffee, alcohol, opium, haschish—all have an influence upon the exercise of the intellectual functions. Certain pathological states of the brain, febrile disturbance, pain, maniacal delirium, cerebral hyperæmia, have the same effect.

> "Dix vibrations au lieu de cinq," says Broussais, "dans un temps donné, peuvent transformer un homme ordinaire en un prodige, en ranimant la mémoire qui fournit à l'intelligence des matériaux qu'elle retrouvait difficilement."*

We know from Abercrombie, and Conolly, and others, how neglected and even forgotten languages may again find expression in words, under the mighty pressure of delirium—sight, sound, memory, imagination—all are quickened into the most intense activity. "The revolutions of disease," says Cabanis, "change the functions of the organs of thought, and give to them energy and perfection; they lead also to favourable crises, which change the dispositions of the organs of sense, or of the brain, and which transform an imbecile, for the rest of his life, into a man of spirit and talent." Morbific processes which involve somatic deterioration are thus pregnant with intellectual immortality. M. Moreau even thinks that "the last words of the dying" frequently derive their so elevated character from that cerebral state which gives to the thinking faculty a clearness and penetration which have never been habitual to the sufferer. "Invisibilia . . . . per ea quæ facta sunt, intellectu conspiciantur." The psychical phenomena which accompany the closing scene are the same as those which manifest themselves in such other circumstances as involve the diminution of personal consciousness—during the invasion of sleep or delirium. When life slowly abandons the nervous centres, and death approaches without shock or violence, the consciousness gradually becomes extinct; and presently, the pilgrim bound for the untried future retains only that cerebral vitality which no longer leagues him with the external world. The personality—"*le moi*"—finds its refuge in this last intrenchment; and from a state of imagination, dream, or delirium, he passes the mysterious boundary which separates earth from heaven.

> "We think we have said sufficient to justify the belief that diseases of the nervous system powerfully favour the development of the intelligence. It will not be forgotten that this is precisely what has been already attributed to scrofulous and rachitic affections. Whence it may be concluded, that in no case could the intellectual functions be more powerful than when these morbid states are united in the same individual—that is to say, when the subject is *scrofulo-rachitic* and nervopathic; in other words, when he borders at once upon idiotcy and insanity. By and in which is of necessity implied this other proposition: every time the intellectual faculties are observed to raise themselves above the level of mediocrity (especially in cases where they obtain quite an exceptional energy), we may be certain that under some form the nervo

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* De l'Irritation et de la Folie, p. 472.

pathic state has influenced the organ of thought, either idiopathically or by inheritance—that is, sometimes by virtue of the innate law, sometimes by virtue of the law of imitation." (Moreau, p. 463.)

From these considerations, then, it follows, that as the mixed intellectual state and the mixed affective state have their origin in an *extra-physiological* condition of the organ of thought, so also have the most transcendent intellectual capacities and aptitudes. *Genius*—the *ne plus ultra* of intellectual activity—is the highest expression of nervousness, that word not being used in an absolute and conventional sense, but as simply synonymous with exaltation of the intelligence, indicating a particular disposition of the faculties, which, always participating in the physiological state, nevertheless already overstep its limits and reach towards its antagonism.

> "It is a verity deduced from, and acquired by, our antecedents, that henceforth in a healthy as in an unhealthy state, every form and shade of intellectual power has the conditions of its existence (*sa raison d'être*) in a particular nervous organism. In fact, the word nervousness simply expresses a special cerebral condition corresponding to what we term *genius*. Genius has a necessary material substratum which is a semi-morbid state of the brain, a true erethism, the source of which now becomes known to us." (p. 465.)

There is no longer any truth, then, in the ancient aphorism, "mens sana in corpore sano." In fact, if the normal state of the organism is in general unison with the regular action of the thinking faculty, the intelligence is never, save very exceptionally, raised above what may be termed honest mediocrity, either as regards the affective or intellectual dispositions. The deterioration of the material man is a condition required for the perfection of the immaterial man. The human intelligence is never so near its downfall as when it tests the full measure of its capacity, and scales the grandest heights of its ambition. The causes of its precipitation, indeed, are the causes also of its greatness. "Le génie (says Lamartine) porte en lui un principe de destruction, de mort, *de folie*, comme le fruit porte le ver." In numberless respects, to trace the physiological history of idiots will be to trace those of men of genius, and *vice versâ*. Their hereditary antecedents are pregnant with wonderful influences, from which have been generated the realities which walk before us, and which in turn excite our sympathy and our admiration. In their ascendants and descendants, in all the extent of the collateral range, nervous affections, insanity of every form, convulsions, diseases of the brain and spinal cord, have abundantly existed. Idiots and members of the scrofulo-rachitic family have given evidence of precocious faculties, and of an intelligence beyond their years, until that morbid principle which was its cause, overstepping legitimate limits, broke the mental equilibrium and shivered the material instrument of its manifestation.* No one who has had much experience of life can have failed to notice the coincidence, too well established to be empirical, of bad health, diminished stature, strange habits and gait, peculiar physiognomy, with great genius. In this truth lies the explanation of the fact, that in every country the portraits of individual greatness (with few remarkable exceptions) are the portraits of individual ugliness, while intellectual mediocrity inclines to more æsthetic proportions; as also of the observation so commonly made after gazing upon strange-looking humanity—"that person is either a great fool or a great genius." And to whichever of these unpromising categories the individual may claim nosological attachment, if you could search his genealogical tree, you would find many of its roots having their common origin in weakness and in power—you would find a madman or a savant hanging upon one of its branches. Thus, what Aristotle said centuries ago—"Nullum magnum ingenium sine mixturâ dementiæ," is not merely a paradox, nor the witticism of a great genius, but a now demonstrated verity, giving exact expression to the revelations of morbid psychology.

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* M. Monfalcon declares that scrofulo-rachitic children have active and discerning minds; that they have great acuteness, are susceptible of lively passions, and indeed, with a perceptive power considerably in advance of the period of life which they have attained. We have ourselves been recently assured by the head master of one of our largest public schools, that the precocious boys and even the intellectual boys are by no means the most satisfactory or the most promising. Their physical integrity is almost invariably

We have thus endeavoured to give our readers a *résumé* of the remarkable theories by which the specialty of the alienist physician is connected with "the philosophy of history." "Jusqu'à quel point," inquires M. Moreau himself, "dans quelle mesure, l'observation vient elle confirmer ces vues générales?" It must be confessed, he admits, that the records of the past are very imperfect in respect of all that we are most interested to know of direct hereditary transmission. Authors speak of the genealogies of celebrated men; they say little, however, of the physical and moral health of those from whom celebrity is descended. Nevertheless, careful biographical researches have put us in possession of facts which, "*en raison de leur qualité*," rather than of their number, appear to be sufficient to establish the justice of our opinions. Yet history is far from being tacit as to a pathological fact from which much information may be gathered—the *modus moriendi* of those who have begotten her illustrious children. And here should be mentioned a fact of primary importance—that amongst that class of society which contains men most distinguished for intellectual eminence, are found, relatively, the most insane.

"That institution (l'École Polytechnique) which has given to France the greatest number of remarkable men, is also that from whence have issued the greatest number of alienated, or, at all events, of those exceptional intelligences with which we are specially occupied." (Moreau, p. 507.) The explanation of the fact does not lie in the nature of the studies to which the pupils are there subjected; for the exact sciences, admitting of no degrees of comparison, are such as should protect those engaged in them from doubt and deviation; but rather in this—that it is only given to dangerously rich and powerful organizations

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below the standard of health; they are morbidly irritable, and commonly of difficult management. And it is worthy of observation, that where they achieve nothing great in after-life, but simply lapse into mediocrity, the circumstance is ordinarily coeval and coextensive with the establishment of perfect animal health, and *vice versâ*.

to study those sciences successfully, at the highest pressure of reason, and therefrom to acquire an undoubted but perilous superiority. And the more we study this intricate and interesting subject, the more we may assure ourselves that brilliant mental qualities are constantly leagued with nervous affections, and that those affections are precisely the most powerful hereditary causes of mental alienation. Yet further: the moral disturbances which are connected with a more or less striking intellectual organization, are indicative of, and attached to, the worst species of cerebral lesions—those rather of idiotcy and imbecility, than to simple perversion of faculties, such as a general or partial mania. And it is a matter of general observation that the children of men of genius are not only for the more part inferior to their parents, but even to the ordinary run of humanity. Few of them escape, during infancy and childhood, from convulsive affections, and various cerebral diseases, which compromise to a certain extent the intellectual functions. This fact does not negative but confirm the law of inheritance; for these intelligential offspring receive transmitted identity of material organization, stamped with a more advanced development of disease than its initiative of intellectuality.

M. Moreau's biographical facts illustrate that for which his previous studies had prepared him: that neither the hereditary law nor the innate law are absolute. Their varied influences alternate in the same family; but neither of them destroys the power of the other. To one or other of five groups or classifications are allied the mighty dead whom our author evokes from the past.

1st Group.—*Insanity, properly so called.*—To this group are attached, directly or indirectly, idiopathically or hereditarily, the following: Socrates, Brutus, the Emperor Julian, Aristotle, Adrian, Lucretius, Charlemagne, Charles V., Peter the Great, Frederic the Great, Cromwell, Richelieu, Catherine de Medici, Bernadotte, Dr. Johnson, Lord Castlereagh, Descartes, Goethe, J. J. Rousseau, Malebranche, Lavater, Swedenborg, Haller, Francis Xavier, Loyola, Auguste Comte, St. Dominic, Luther, Savonarola, Joan of Arc, Newton, Kepler, Watt, Tasso, Swift, Shelley,[*] Burns, Chatterton, Raphael, Beethoven, Donizetti, Walter Scott, Daniel O'Connell, &c. &c.

2nd Group.—*Eccentricity.*—Lord Chatham, Lady Hester Stanhope ("la Sybille du Liban, qui a rempli l'Orient du bruit de ses excentricités"), Pitt, De Balzac, De Lammennais, Fontaine, Santeuil, &c.

3rd Group.—*Idiotcy or Rachitis.*—Alexander the Great,[†] Philip his father, Pericles, Æsop, Quintilian, Pascal (a sufferer from the cradle to the grave), Thomas Aquinas, Queen Christina, Condé, Pope, Gibbon,

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[*] Moreau's acquaintance with historic characters is hardly commensurate with his zeal for the establishment of a particular theory. He divides poor Shelley into two parts, and Lord Herbert of Cherbury into three. Thus, he writes: "EDWARD, LORD HERBERT, CHERBURY—*Ont* eu des hallucinations. SHELLY—Etait sujet à des visions de démons. PERCY BISSHEE—Croyait à la réalité des apparitions." (p. 539.)

[†] Alexander's brother, Arrhideus, was an idiot, and he himself died at the age of thirty-two, of a disease presenting all the characters of *delirium tremens* (see Plutarch). There is a coin in the Bodleian Library at Oxford, with the head of Alexander upon it—a narrow and contracted type.

Lord Byron, Washington, Alfieri, Mozart, Mirabeau, Talleyrand, Cuvier, &c.

4th Group.—*General Nervousness.*—Demosthenes, Cæsar, Alcibiades, Sophocles, Mahomet,* Leo X., Leibnitz, Petrarch, Metastasio, Molière, Paganini, Turenne, Albinus, Malherbe, &c.

5th Group.—*Lesions of the Nervous Centres.*—Attila, Catherine (Empress of Russia), Elizabeth (Queen of England), Louis XI. (also his grandfather and father, Charles VI. and VII.), Louis XIV., Napoleon, Plutarch, Voltaire, Condillac, Bossuet, Dante, Milton, Linnæus, Montesquieu, Madame de Staël, Michael-Angelo, Louvois, Bichat, Hoffmann, John Hunter, Boerhaave, &c., &c.†

What an "aristocracy of talent!" What a glorious group of madmen!

Such is the extraordinary treatise to which we have invited consideration, and of which we have endeavoured, as far as succinctness and condensation admitted, to give a faithful exposition. To some this work of M. Moreau's may appear of a strictly postulatory character. We do not ourselves so regard it, for we are acquainted with very many facts, independent of his own, which directly sustain his position. The theory propounded is startling, and in a measure novel. But, after all, it is based upon the well-established physiological axiom, that excess of vital energy involves an undue expenditure of material force, and consequently imperils the integrity of the material organization. The facts which bear out this theory are necessarily imperfect, and therefore the deductions drawn from them are to be received with caution. Alas! that caution should frequently, even in the realms of science, be only another name for prejudice and misrepresentation. "Read not (said Lord Bacon) to contradict nor to believe, but to weigh and consider." A precept inculcated by the great founder of inductive science may be thought not unworthy of our reception. It is no argument against a new theory that it has a "particular tendency," that it is at variance with the antecedents of knowledge, and would fain free itself from the fetters of conventional thinkings. Science has reconciled us to many things which were once heresies, and are now known to be truths, resting on a basis as sure and solid as that of "the everlasting hills." "La science psychiatrique," as our author constantly reminds us, was, comparatively speaking, born but yesterday. And as the physical man has not really been known until he was studied in his morbid aspect, under the pressure of those anomalies and perturbations to which his organs and systems of organs expose him—so, only by the light of morbid psychology have we been able, imperfectly indeed as yet, to acquaint ourselves with the true economy of man's moral faculties. It matters not, surely, that idiotcy and intellectuality "ont des communes racines"—"*in radice conveniunt.*" It is, in reality, no more startling than the fact that good and evil multiply to an illimitable extent with the march of civilization; or that the brain is the material organ of thought; or that, companioned *by* and *with* ourselves from the cradle to the grave, *of* ourselves we know nothing. If it is "a mad world, my masters"—what then? If "profligates, madmen, and hysterical Rousseaus, hysterical Shelleys, uttering words like the east wind," do encompass and surround us, are they not "His Cosmogony?" We tremble, we turn aside, we are dismayed, by the innumerable contradictions and antagonisms which choke up our path, and render it dark and sometimes almost impenetrable. But the true disciple of science knows that if "Inquiry does not stand at the door of the house, Doubt will enter in by the window;" and the true Christian philosopher has an inward assurance that, some time and somehow, all the anomalies which now perplex him shall be reconciled; and he looks upon the present and the future with unmeasured hope and consolation.

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* Mahomet should be attached to the first and fifth groups rather than to the present one; he was the subject of epileptic fits, of constant hallucinations, and under the pressure of great excitement he frequently "bellowed like a young camel." (See his Life, by Washington Irving.)

† M. Moreau includes in this group a number of great men who have died of apoplexy," and the Duke of Wellington among the number. As far as we recollect, the Duke died from syncope—the syncope of old age, dependent upon want of arterial tone, lack of power, from ossification of the arterial coats, to sustain the cerebral circulation. This group, therefore, of our author, is far too comprehensive, for both apoplexy and syncope are common terminations of old age, quite irrespective of genius.

We must devote a few lines to the monograph of Dr. Wachsmuth—a brief but really valuable contribution to the study of mental science. Like MM. Morel and Moreau, the German author is a disciple of the materialistic school. Starting from the position that psychology is the only foundation on which "Psychiatry" can be built, he shows that the same method is to be pursued in the physiology and pathology of the mind as in natural science. And as this method clearly determines the brain to be the organ of the psychical functions, so his work presupposes a structural knowledge of the brain, with its nerves and ganglions. The question whether in (what is termed) mental disease the mind itself is diseased, is a verbal one: but science, freeing itself from conventional expressions and modes of thought, must adhere to strictly scientific language; and pathological physiology must not speak of a disease of a function, but of an interruption to it, and limit the term disease to that material organ through which the function manifests itself. The task, therefore, which Dr. Wachsmuth proposes to himself is to investigate the pathological physiology of the mind, and to refer each variation of mental disturbance to an universal law. Accordingly, in the first book of his treatise, he enters on the general physiology of the mind, and treats of the origin of ideas ("*Vorstellungen*") both general and particular, and of feelings. His conclusion is similar to that of M. Moreau—that they arise from a nervous tension ("*surexcitation nerveuse*"), having its seat in the nervous cells. He then analyses the more complicated processes of impulse and volition. All volition (he says) depends upon representations or ideas which, by their mutual relationship, develop a nervopathic tension, which brings with it an impulse to relaxation of the same. So long as active representation goes on in a normally-formed physical organ, and so long as the normal ways in which representations arise are controlled by sound organs of sensation, a man may be said to be psychically free; but this freedom is limited by certain definite psychological laws, and is not primary; as volition presupposes more than instinct—a considerable development of mind, and extent of consciousness. The more cultivated the mind, the greater, *cæteris paribus*, will be the field of of its volition, and therewith the appearance of its freedom. It should be borne in mind that mental freedom and moral freedom are not strictly identical terms.

Closely connected with the question of psychical freedom is the further one of accountability ("*Zurechnungsfähigkeit*"). If we are to attribute psychical acts to an individual, we presuppose that those elements which determined the act took place, or were elaborated, in a normal organ, without hindrance, and that they had reference to an individuality as subject of the psychical process. Accordingly, in forensic medicine, there will be two points to be demonstrated: 1st, that a definite act has proceeded from the individuality of a definite man; 2nd, that the volition which generated the action was the volition of the person to whom the action is attributed. We cannot, therefore, "attribute" moral responsibility in the following cases: 1st, where individuality to which we attach the volition was restrained in its liberty; 2nd, where the individuality to which the volition belongs is under the pressure of physio-pathological predisposition; 3rd, where the individual responsibility is utterly lost by reason of morbific processes.

In the second book the author enters upon the general pathology of the mind, and treats of the origin of every kind of psychical disturbance; and by a minute description of the symptoms of every form of mental alienation, properly classified, he has unquestionably deserved well of the physician devoted to this specialty. The whole is illustrated by cases which have been selected (we learn in the preface of the work), not because of their exceptional and interesting, but because of their ordinary character; for cases of every-day occurrence best illustrate the laws of psychical action which it is our object to establish. It should be added, that both in the derangements of exaltation and depression, Dr. Wachsmuth invariably gives a valuable medico-legal significance to the occurrence of "lucid intervals." The treatise is one to which no brief analysis can do justice; and we shall be glad to see our medical literature enriched by an English translation of this and the philosophic work of M. Moreau.

REVIEW II.

Clinical Lectures on Certain Acute Diseases. By ROBERT BENTLEY TODD, M.D., F.R.S., formerly Physician to King's College Hospital. —*London*, 1860. pp. 487.

WE approach the examination of this work with a peculiar sense of the responsibility that attaches to our critical judgment, inasmuch as it inculcates doctrines of vital and fundamental importance in the practice of medicine, and inasmuch as its accomplished author no longer lives to defend those views, which during life he so ably taught. The work was given to the public during the interval which elapsed between Dr. Todd's lamented death and the day on which his funeral took place. It may therefore be justly regarded as his parting legacy to his old pupils and professional brethren, and the more so as its main object is to promulgate those views upon which his own great success in life mainly depended. Dr. Todd's sudden death in the very prime of life, and just when his many years of hard labour were about to be rewarded by a high share of professional success, teaches a sad but impressive lesson as to the vanity of all human hopes, and more especially as to the precarious nature of the aims and hopes of that section of our profession which limits itself to the practice of pure physic.

We purpose in the first place to make a few observations on Dr. Todd's mode of treatment of acute diseases, and afterwards to notice briefly the several diseases treated of in the work before us.

Dr. Todd's principles of treatment in acute diseases may be summed up in the following four propositions:

"1. That the notion so long prevalent in the schools, that acute disease can be prevented or cured by means which depress and reduce vital and nervous power, is altogether fallacious.

"2. That acute disease is not curable by the direct influence of any form of drug or any known remedial agent, excepting when it is capable of acting as an antidote or of neutralizing a poison, on the presence of which in the system the disease may depend (*materies morbi*).

"3. That disease is cured by natural processes, to promote which in their full vigour, vital power must be upheld. Remedies, whether in the shape of drugs, which exercise a special physiological influence on the system, or in whatever form, are useful only so far as they may excite, assist, or promote these natural curative processes.

"4. That it should be the aim of the physician (after he has sedulously studied the clinical history of disease, and made himself master of its diagnosis) to inquire minutely into the intimate nature of these curative processes—their physiology, so to speak—to discover the best means of assisting them, to search for antidotes to morbid poisons, and to ascertain the best and most convenient methods of upholding vital power."

The following is Dr. Todd's opinion in reference to the value of mercury in the acute inflammations:

"The much-vaunted powers of mercury as a remedy not only to promote the resolution of acute inflammation, but also to cause the absorption of its product, lymph, rests first upon a false analogy, and secondly upon imperfect knowledge of clinical history.

"It was found that iritis, the result of the influence of syphilis, was cured under the use of mercury with a rapidity and certainty which did not belong to any other kind of treatment. Lymph effused in more or less quantity upon the surface of the iris, and even recent adhesions glueing the margin of the pupil to the capsule of the lens, quickly melted away under the peculiar change which mercury was capable of inducing.

"*Primá facie*, there was no more reasonable suggestion than that mercury would exercise a similar influence on inflammations of like tissues to the membrane of the anterior chamber, and promote the removal of any lymph that might be effused upon them, preventing adhesions, or dissolving them if formed.

"But although it was a perfectly reasonable suggestion to give full trial to the use of mercury in inflammations of serous membranes, the analogy did not justify the expectation of such decisive results as were obtained in syphilitic iritis and rheumatic pericarditis, or pleurisy, than in the tendency of both inflammations to develope lymph and to cause adhesion of opposed surfaces. Nor in any of their other effects was there any such marked similarity between the syphilitic and the rheumatic poisons as would fully justify the expectation that the experimental trial of mercury for the cure of such inflammations would prove successful.

"And what has been the result of the long-tried use of mercury in both affections, syphilitic as well as rheumatic? Why, that whilst in the former mercurial treatment has never ceased to find favour with practical men, in the latter such has not been the case. No one would now venture to assert that mercurial influence, however quickly induced, ever checked pericarditis or pleurisy, nor would it be easy to adduce an instance in which mercury broke down adhesions or prevented their occurrence.

"Examples were no doubt of frequent occurrence in which such effects *appeared* to follow the use of mercury. But a more intimate acquaintance with clinical history has taught physicians that changes are apt to occur which simulate the absorption of a lymph deposit. It is very common to find a marked pericardial friction-sound disappear for a time, and the hopeful practitioner is led to regard this as the result of his remedies, especially of the use of mercury. In a day or two the friction-sound returns, and the practitioner is forced to conclude that his remedies have not produced the desired result. And there are the best reasons for inferring that the early temporary suspension of the friction-sound is due in a large number of cases to a slight liquid effusion, which separates the opposed rough surfaces, and so destroys the friction-sound, which, however, returns on the re-absorption of the liquid. Moreover, it is now proved by a multitude of examples that pericarditis will do perfectly well without mercury—nay, better than with it—and that in general the real benefit which the patient derives is to be referred to the opium with which the questionable mercury is combined.

"How often and often has the author most anxiously watched a mitral bellows murmur, caused by recent endocarditis in patients under mercurial treatment, hoping to discover that it had disappeared under the mercurial influence! Yet in his whole experience he is unable to discover a single case in which such a murmur had been even modified by any influence, save that of good nourishment, as tending to maintain a normal state of blood and of tissue, as furnishing opportunity for the mechanical wearing down (by attrition) of the deposited lymph."

It has been contended by many of Dr. Todd's disciples that he was the originator of a new system of medicine, and the writer has even heard it stated, on more than one occasion, that his views on treatment were more than a century in advance of the age in which he lived. Now, while we entertain the greatest respect for the memory and labours of Dr. Todd, we cannot but think such language quite uncalled for, and we are unable to discover anything peculiar or original in Dr. Todd's principles of treatment as above laid down by himself. They are the same principles which are advocated by a large body of modern physicians, and Dr. Todd has no claim whatever to their origination, although he may have been an active promulgator of them among his own students. The homœopathists, Dr. Bennett of Edinburgh, and Sir John Forbes, have far more claim than Dr. Todd to their origination, or perhaps more correctly to their revival, and to their propagation among the profession at large. These principles have effected a great revolution in medical practice in this country, but it is doubtful whether in many instances they have not been pushed too far. Into this question we shall not enter at present, as the subject has on more than one occasion already occupied our attention. It is well known, however, that it was not the principles themselves, but the manner in which they were carried out, which constituted the peculiarity of Dr. Todd's treatment in both acute and chronic diseases. It was not the mere substitution of stimulants for depletion, but it was the enormous amount of alcoholic stimulants which it was the habit of our author to prescribe in the great majority of diseases.

But even here there was no novelty in Dr. Todd's treatment. It was merely a revival, or perhaps an exaggeration, of the "Brunonian System," which towards the end of last century gained such ascendancy in the profession, not only in Britain, but also upon the Continent. Brown divided diseases into sthenic and asthenic. In asthenic diseases he supposed that there was a great diminution of that *excitability* which, according to him, was the source of life and functional activity; and although in sthenic diseases he fancied that this excitability was increased, yet even here he insisted that in many cases a condition of *indirect* debility was induced by exhaustion of the excitability. Debility, in fact, he made out to be in some way or other the cause of all diseases, both acute and chronic. ("Debility is the cause of the intermittent, as well as of every form of fever." Prop. cxxii.) His treatment for almost all diseases consisted in the administration of wine, spirits, opium, and abundance of nourishing food.* These remedies, it was thought, furnished an increased supply of material, by the consumption of which a stimulus was generated and debility counteracted, in the same way as flame is generated in fire by the supply of additional air or fuel. Brown himself failed to amass any fortune through his novel doctrines; he died in London in 1788 in utter obscurity. The Brunonian System, however, did not die with him. It was adopted everywhere, and the more readily, perhaps, as it had previously been far too common to starve and debilitate patients labouring under most diseases. During the last twenty years of the eighteenth century Brunonism was all the rage; the 'Elementa Medicinæ' was translated into German and Italian; in Germany, Brown was hailed as the *medical Luther*, and there was scarcely a university which had not a sect distinguished by the title of Brunonians. In the University of Göttingen the students carried their dissensions so far that they came to blows, and a military force was called in to quell the disturbance.*

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* Elementa Medicinæ, 1780; also a translation of the Elements, with a Biography of Brown, and an Exposition of his Doctrines, by his son, Dr. William Cullen Brown, 3 vols. 8vo. 1804.

By and by a reaction came. In 1805, Dr. Joseph Frank thus writes:

> "The Brunonian system is daily more and more modified, so that it is scarcely to be recognised. You will be astonished to hear that I have deserted it. 'What system,' you will ask, 'have you then adopted?' None. I consult my own experience, and benefit by all correct observers, whether they belong to the new or to the old school. *It is only since I have adopted this method that I feel as if I were a physician.*"†

Well would it have been for medicine had this happy medium not been transgressed. Unfortunately, however, the writings of Broussais, Mills, Beddoes, Clutterbuck, Armstrong, and others, who endeavoured to show that all diseases necessarily proceeded from inflammation or congestion, soon drove the mass of the profession into an opposite extreme, the effects of which are still manifest, and at the present day even the name of Brown is known to few of the younger members of the profession. The following extract from the writings of one of our principal London physicians in the year 1819 is of no small interest at the present day in connexion with the substitution of a depleting system of Brunonianism:

> "I believe," says Dr. Bateman, "there are few physicians who, like myself, commenced their professional career impressed with the doctrines that prevailed in the schools at the close of the past century, in which the terror of debility was certainly predominant, who will not acknowledge that their subsequent practice has been a continued struggle between the prejudices of education and the staring conviction of opposing facts, which were continually forcing themselves upon their observation, and that they have more especially been compelled to a gradual but material change in their views respecting the use of the lancet, not only in fever but in other diseases. I am fully convinced of the extent to which my own practice has been cramped by this prejudice, and of the reluctance with which I have admitted the evidence of my senses, till frequent repetitions, and the sanctions of other authorities, had rendered it irresistible. My testimony on this point, therefore, cannot be deemed the result of haste or temerity."‡

These revolutions in medical practice have been accounted for on the supposition that diseases pass through periodical changes of type. It would be out of place to enter into this subject on the present occasion; but it may be simply observed that, as Dr. Todd states, there are no good grounds for believing in the existence of any such cyclical changes in the type of disease. There can be no doubt that certain diseases may be modified in various ways at different times and places, but there is no evidence to show that disease becomes universally modified in cycles of years, in the sense of what is ordinarily understood by change of type. Should this be so, what a deplorable picture we have of the changes of type in the human mind in reference to the treatment of disease, rushing first into one extreme and then into another. The same course of events which occurred towards the end of last century has been re-enacted in our own day. It became then the fashion for a large and influential party in the profession to attribute all diseases to debility, and to treat them all alike by stimulants, and so it is with a party in the profession now. Is there no danger, if this extreme be pushed too far, that, now as then, a reaction may take place—that the reign of bloodletting may return—and that fifty years hence some physician may consider himself justified in adopting language similar to that of Bateman?

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* Edinburgh Medical and Surgical Journal, vol. iii. p. 506. For much of the above information the writer is indebted to a short memoir of Brown, contained in Dr. W. T. Gairdner's Lectures on Medicine and Medical Education. Edinburgh, 1858.

† Edinburgh Medical and Surgical Journal, vol. ii. p. 499.

‡ Bateman on the Contagious Fever, pp. 97, 98. London, 1819. 8vo.

From Dr. Todd's long connexion of twenty years with King's College Hospital, we had hoped that the volume before us would have contained some conclusive evidence in favour of his stimulating mode of treatment, but it must be confessed that we have been not a little disappointed. Accounts are given, it is true, of many individual cases, but there are few rational physicians, we suspect, who would pin their faith to any system of treatment from the histories of individual cases. Observers interested in the success of any particular line of treatment are far too apt to attribute any favourable change in the symptoms of disease to the effects of the remedies which have been employed. Such sources of fallacy are innumerable; one applicable to the present case may be mentioned. One of the facts upon which Dr. Todd was wont to insist, and which is often urged by his disciples in proof of the favourable effects of enormous doses of stimulants in typhoid fever, is that a sudden fall of the pulse not unfrequently takes place soon after the commencement of the stimulants. We have watched many such cases under Dr. Todd's care, and in almost every one in which the fever had not already reached its natural termination, the pulse rose again. This rise in the pulse was set down to a deficiency of the stimulus, which was consequently increased, and again with the effect of reducing the pulse after a time. But what was the real meaning of all this? Careful observation of typhoid fever will show that the pulse is extremely variable in frequency from day to day, and that similar variations to those noticed when large doses of stimulants are given, will occur when no stimulants are taken at all.

The following variations of the pulse were observed in a female aged eighteen, affected with typhoid fever, and who, throughout the whole course of the fever, had no stimulants of any sort—on the eighth day the pulse was 96; on the ninth, 100; on the tenth, 120; on the eleventh, 88; on the twelfth, 100; on the thirteenth, 80; on the fifteenth, 60; and on the sixteenth, 84. There was no improvement in the general symptoms on the eleventh day, and fresh rose-coloured spots continued to come out until the eighteenth day. In a lad, aged nineteen, labouring under typhoid fever, the pulse varied from day to day between 90 and 112, although no stimulants were taken. In a female, aged twenty-three, the pulse between the fifteenth and twenty-fourth days varied from 70 to 108, although no stimulants were given. In another female, aged thirty, the pulse between the twelfth and twenty-eighth days of the disease was scarcely the same as two successive days, varying from 96 to 128; although the quantity of stimulants (wine, six ounces) taken was the same from first to last. In cases such as these, if stimulants had been given for the first time, or if their quantity had been increased immediately before any fall in the pulse, the diminished rate of pulsation would naturally be ascribed to the effects of the stimulants, especially by any one anticipating such a result. Moreover, if this result had not at once taken place, and if the failure had been accounted for by a deficiency of the stimulus, which was consequently increased, the fall of the pulse, which would naturally after this interval of time have at length occurred, might have been imputed to the increase of the stimulus.

With the above facts before him, the reader will be able to judge for himself of the force of Dr. Todd's argument, when in commenting upon a case of typhoid fever, which proved fatal under the use of large doses of brandy, he observes—"Nor can it be said that he had too much stimulant; for we had this most striking fact, that with the increase of stimulants the pulse on successive days fell from 120 to 84, and that with their diminution it rose again to 120 and 130." (p. 110.)

The only evidence, save that of individual cases, which Dr. Todd has brought forward in support of his treatment, has reference to pneumonia. All the cases which had occurred in the hospital under his care from the year 1840 to 1859, are collected, and the results may best be given in Dr. Todd's own words:

> "The cases are in all 78, and they have been taken just as they have been noted down in the case-books. They may be arranged into two periods—the one from 1840 to 1847, the other from 1847 to 1859. In the former of these, which may be termed the period of reducing treatment, the remedies employed were bleeding, the application of blisters, the exhibition of tartar emetic, and the more or less free use of mercury; while in the latter, which may be styled the period of supporting treatment, the patients were treated very much in the manner which I have detailed to you in this and other lectures on this subject, though in a few cases calomel and opium were given. Now, the total number of cases, as I before mentioned, was 78, and of these 10 were fatal.
>
> "Of the 78 cases, 25 occurred in the first period, and 4 of these proved fatal, or about 1 in every six. In the second, the number of cases was 53, and in these there were only 6 deaths, or about 1 in every 9; fairly leading, I think, so far as we may judge from the relative mortality in these two periods, to the inference, that the supporting plan of treatment is more favourable (certainly not less favourable) in its results than the severer measures which are frequently had recourse to in this disease."

Dr. Todd, however, gives us no information whatever as to the comparative ages of the patients in the two periods, their constitutions, the stage of the disease at which they came under treatment, the extent of the disease, the frequency of double pneumonia, the locality of the disease, whether commencing at the base or apex of the lung, and the frequency of complications; or to sum up, as to the comparative frequency of sthenic and asthenic cases. But in a previous number of this Review,* it has been shown that all these causes may operate to increase the fatality of the disease, whatever be the treatment employed, and that, without taking such particulars into consideration, it is perfectly futile to attempt to prove the superiority and success of any particular treatment by appealing to statistics. If any one of several of the causes just mentioned be in undue proportion absent or present, the results, *cæteris paribus*, will in like proportion be happy or unfortunate; and it is only by the close observation of each case, and the rigorous analysis of the whole series, that we are justified in even approximately estimating the comparative success or failure of two opposite plans of treatment.

Again, Dr. Todd makes no allowance for the circumstance, the truth of which in another part of his work he allows, that the fatality of pneumonia varies very much in different years, these variations depending not upon differences in treatment, but upon variations in the severity of the disease. Thus, in St. Mary's Hospital 1 died in 8·6 cases in 1854, 1 in 2·15 in 1855; in the Edinburgh Infirmary, 1 died in 2·4 in 1847–48, 1 in 5·2 in 1848–49; in the Aberdeen Infirmary, 1 died in 2·7 in 1853, 1 in 10 in 1855, and not one of 18 cases in 1856.

But setting aside the influence of all these collateral causes, and supposing them to be the same in the two periods into which Dr. Todd divides his cases, the results of Dr. Todd's stimulating system, as compared with the results of the old system of bleeding and blistering and the administration of calomel and opium, appear to us to be far from satisfactory. If it be legitimate to draw conclusions as to treatment from statistics, there are no statistics which apparently have been drawn up with more care than those of Dr. Bennett of Edinburgh. During eight years Dr. Bennett has had under his care, in the Royal Infirmary, 65 cases of acute pneumonia, of which 3 died; that is, only 1 in 21⅔. Moreover, all the three fatal cases were complicated with other diseases—one with diarrhœa and disease of the intestines, another with persistent albuminuria and anasarca, and a third with delirium tremens and meningitis. Of all the uncomplicated cases, 55 in number, not one died, although many of them were very severe, the disease frequently involving the whole of one lung, and in 11 cases portions of both lungs. Now, Dr. Bennett's treatment, which is designated "a treatment directed to further the natural progress of the disease," agrees with that of Dr. Todd in abstaining from bleeding and calomel; but here the agreement ends. During the period of febrile excitement, Dr. Bennett contents himself with administering frequent small doses of tartar emetic (a treatment which Dr. Todd would certainly have considered lowering to an injurious degree); and as soon as the pulse becomes soft, he orders good beef-tea and nutrients, and wine to the extent of from four to eight ounces daily, only if there be marked weakness. When the crisis approaches, he gives diuretics to favour the excretion of urates.*

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* British and Foreign Medico-Chirurgical Review, July, 1856, p. 33.

Much additional evidence to the same effect might be adduced, but enough has been said to show that Dr. Todd has entirely failed in adducing any satisfactory data in proof of the success of his treatment of pneumonia by large doses of stimulants. Before we leave the subject of pneumonia, we would observe, that the quantity of stimulants which Dr. Todd was sometimes in the habit of prescribing was very much greater than would appear from the perusal of any of the cases contained in the volume now before us. We have ourselves watched two or three cases under his care, in which, for upwards of twenty-four hours, and in one instance for nearly forty-eight hours, brandy was administered at the rate of half an ounce every half hour; and in one of these cases, so much as half an ounce every quarter of an hour was given for seven or eight hours.

There is another class of diseases for which we possess data sufficient to enable us to draw some conclusions as to the results of this stimulating treatment—the class of continued fevers. About a year before his death, Dr. Todd handed over to the writer of this review all his hospital case-books from the year 1840 to 1858, for the express purpose of analysing the results of his treatment. The writer spent several months in going over these case-books, sixty in number, and drew up a tabulated analysis of the symptoms and treatment of every individual case, subdividing them, so far as this was practicable, into the different species of continued fever, and eliminating those cases which were entered in the case-books as "fever," but in which the fever was in all probability not idiopathic, but due to some local inflammation. It would occupy too much space to enter into all the details of this analysis, but the following are some of the more important results as bearing upon the subject under discussion, while the tables themselves are open to the inspection of any interested in the subject:

The total number of cases, then, entered as "fever" amounted to 337, from which 9, in which the result was doubtful, have to be deducted. Of the remaining 328, 60 died, or the rate of mortality was 18·29 per cent.

Of the total 337 cases entered as "fever," 42 were in all probability either not examples of idiopathic fever at all—the fever being due to some local inflammation, renal disease, &c.—or it was impossible from the description to say what the nature of the fever was. Of these 42 cases 6 died, and in 5 the result was doubtful.

The remainder, after deducting 3 in which the issue was doubtful, amounted to 292. Of these 54 died, or the mortality was 18·49 per cent.

Of the total 293 cases, 108 were examples of typhus, 131 of typhoid or pythogenic fever, 24 of relapsing fever, and 29 of simple fever or febricula. None of the cases of relapsing fever or of febricula proved fatal.

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* Dr. Bennett's Clinical Lectures on the Principles and Practice of Medicine, p. 284 et seq. Second edition, 8vo, 1858.

Of the 108 cases of typhus, 28 died, or the rate of mortality was 26 per cent. Of these there were admitted since the 1st of January, 1847, 75 cases, of which 18 proved fatal, or the rate of mortality was 24 per cent.

Again, of the 131 cases of pythogenic or typhoid fever, 27 died, or the rate of mortality was 20·61 per cent. Of these there were admitted since the 1st of January, 1847, 101 cases with 17 deaths.

The results before and after the year 1847 have been compared, inasmuch as Dr. Todd tells us that about that period his treatment of pneumonia underwent a decided change. Such a division of the cases of continued fevers, however, is scarcely necessary, for it would appear from the records of Dr. Todd's case-books that almost from the first he was in the habit of prescribing large quantities of stimulants in these diseases. So early as April, 1843, a case of typhus is recorded, in which it is stated that, during the last twelve hours of the patient's life he consumed two bottles of brandy and one of wine.

Now, we have no hesitation in declaring, as the result of considerable investigations into this subject, that the rate of mortality of Dr. Todd's fever cases was much in excess of that of any other hospital in the United Kingdom. The reader is particularly referred to an essay on the Etiology of Fever, in the 'Medico-Chirurgical Transactions,'* where a table will be found showing the rate of mortality from continued fever, during a series of years, in ten different hospitals in Great Britain and Ireland. In none of these did the rate of mortality exceed 14 per cent. Even in the London Fever Hospital, where from various causes the mortality might be expected to be unusually high, it was under 16 per cent., the precise numbers during ten years (1848 to 1857) being 6628 cases, 1059 deaths, the mortality being 15·98. Moreover, no small number of the cases brought to the London Fever Hospital are moribund on admission, so that, deducting 61 cases which proved fatal within twenty-four hours after admission, the mortality was only 15·19 per cent.; and deducting 146 cases fatal within forty-eight hours, the mortality was only 14·07 per cent. In two only of Dr. Todd's cases did death take place within forty-eight hours of the patient's admission into hospital.

When it is remembered that the patients admitted into the London Fever Hospital consist, for the most part, of the aged and decayed inmates of the metropolitan workhouses, who are frequently brought to the hospital in an advanced stage of the fever, from long distances, sometimes from the very opposite extremities of the metropolis, it will be allowed that, as regards the class of patients, the comparison was in favour of King's College Hospital, into which no patients are admitted from the workhouses, and where most of the fever cases come from the immediate vicinity. Moreover, the Fever Hospital laboured under the possible objection, which no one could have urged more strongly than Dr. Todd was wont to do, that the concentration of the fever poison tends to increase the danger of a fatal result. Now, the treatment which has been pursued in the Fever Hospital is widely different from that advocated by Dr. Todd. In a very large number of cases no wine or spirits has been given throughout the whole course of the disease. Wine has been given in those cases only in which there has been much prostration, and brandy has been given only in the very worst cases.

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* Contributions to the Etiology of Continued Fever, or an Investigation of various Causes which influence the Prevalence and Mortality of its different Forms. By Charles Murchison, M.D., vol. xli. 1858.

But it has been shown in the essay already quoted that it is useless to compare the results of treatment of continued fever at different places, unless we discriminate between the various forms. Febricula is never fatal, and relapsing fever but sparingly so; consequently, the larger the proportion of these two forms, the smaller will be the total rate of mortality. Unfortunately, it is only at a few hospitals that the different forms of fever have been distinguished, but so far as this has been done, Dr. Todd's results still present an unfavourable contrast.

Of 3506 cases of typhus admitted into the London Fever Hospital during the ten years 1848 to 1857, 715 died, or the mortality was 20·39 per cent. Deducting 49 cases which proved fatal within twenty-four hours, the mortality was 19·32 per cent., and deducting 115 cases fatal within forty-eight hours, it was only 17·69 per cent. Again, out of 9485 cases of typhus admitted into the Glasgow Infirmary during eleven years (1843 to 1853), only 18 per cent. died.

Of 1820 cases of typhoid fever admitted into the London Fever Hospital during the same ten years, 333 cases, or 18·29 per cent., died. Deducting those fatal within twenty-four hours after admission, the mortality was only 17·66 per cent., and deducting those fatal within forty-eight hours, it was only 16·97 per cent.

The circumstance that none of Dr. Todd's twenty-four cases of relapsing fever proved fatal will not be thought surprising, when it is known that out of 441 cases admitted into the London Fever Hospital, only 11 cases, or 2½ per cent. died, and that this rate of mortality has never at any place been much exceeded.

But again, there is no circumstance which influences more the rate of mortality of continued fevers than the age of the patients. This remark applies particularly to typhus. For example, of the cases of typhus at the London Fever Hospital, between ten and twenty years of age, only 1 in 21 died, whereas of the cases above thirty years of age, the mortality was about 1 in 2⅘, and of the cases above fifty years, the mortality was 1 in 1⅘. Consequently, if the average age of Dr. Todd's cases were greater than that of the cases admitted into the London Fever Hospital, the mortality might be expected to be greater, quite irrespectively of the nature of the treatment adopted. But on investigation, it is found that the average age of Dr. Todd's cases was considerably less than that of the cases admitted into the Fever Hospital. Thus the mean age of 3456 cases of typhus in the Fever

Hospital was 29·33, and the mean age of Dr. Todd's 108 cases was only 27$\frac{20}{27}$. The same fact may be expressed in a different manner:

Dr. Todd's Cases.

Under twenty years, 34 cases and 6 deaths, or 17·64 per cent.
Above twenty years, 74 cases and 22 deaths, or 29·73 per cent.
Above thirty years, 41 cases and 15 deaths, or 36·58 per cent.
Above forty years, 25 cases and 10 deaths, or 40· per cent.

London Fever Hospital.

Under twenty years, 1109 cases and 61 deaths, or 5·5 per cent.
Above twenty years, 2347 cases and 643 deaths, or 27·39 per cent.
Above thirty years, 1509 cases and 544 deaths, or 36·05 per cent.
Above forty years, 916 cases and 400 deaths, or 43·66 per cent.

From this it would seem that the relative mortality of Dr. Todd's cases was greatest in those under thirty years of age.

With regard to typhoid fever, it should be observed that the majority of the patients are under thirty years of age, and that there is a greater uniformity in the rate of mortality at different periods of life than in typhus, although the mortality certainly increases considerably as life advances. But here also the mortality at all ages of Dr. Todd's cases was greater than that of the cases admitted into the London Fever Hospital. Of 1772 cases in the Fever Hospital, the mean age was 21·25, and of 130 of Dr. Todd's cases it was 21·63. This slight excess in the mean age of Dr. Todd's cases is due to five cases having been at a somewhat more advanced age than the rest. Still, the rate of mortality at different ages of Dr. Todd's cases exceeded the mortality at corresponding ages in the Fever Hospital. Thus:

Dr. Todd's Cases.

Under twenty years, 63 cases and 11 deaths, or 17·46 per cent.
Above twenty years, 67 cases and 16 deaths, or 23·88 per cent.
Above thirty years, 18 cases and 9 deaths, or 50· per cent.
Above forty years, 7 cases and 5 deaths, or 71·42 per cent.
Above fifty years, 5 cases and 4 deaths, or 80· per cent.

London Fever Hospital.

Under twenty years, 876 cases and 131 deaths, or 14·95 per cent.
Above twenty years, 896 cases and 199 deaths, or 22·21 per cent.
Above thirty years, 252 cases and 71 deaths, or 28·17 per cent.
Above forty years, 92 cases and 27 deaths, or 29·14 per cent.
Above fifty years, 26 cases and 14 deaths, or 53·84 per cent.

Neither time nor space will allow us to pursue this comparison farther at present, but it might be shown that complications were quite as frequent in Dr. Todd's cases, and that the duration of the cases was certainly not less.

From what has been stated, it seems legitimate to conclude that no advantage is to be derived in the treatment of continued fevers by administering as a general rule such enormous doses of stimulants as were wont to be prescribed by Dr. Todd; and indeed it may be doubted if in many instances, more especially in young persons, such large quantities are not positively injurious.

Now, if this be so, and if we regard the matter in a simply mercantile point of view, the subject is of some importance to the governing committees of our different hospitals. If such large doses of brandy and wine as were prescribed by Dr. Todd are given in individual cases, the total consumption of these fluids in one year must be enormous; indeed, it is a notorious fact that the consumption of wine and spirits at King's College Hospital has almost doubled in amount, in proportion to the number of patients treated, that of any other hospital in the United Kingdom. In the year 1858, the number of beds being 140, and the total number of patients being 1622, the consumption was as follows:

Port wine	1358	pints.
Sherry wine	27	"
Brandy	2940	"
Gin	90	"
Whisky	35	"

The total expenditure upon these items amounted to 404*l.* 3*s.* 4*d.*

At St. Mary's Hospital in 1855, the number of beds being 150, and the total number of patients treated being 1453, the expenditure under these heads amounted to only 210*l.* 5*s.* 10*d.*, a sum, moreover, which included the spirits of wine employed in the laboratory for pharmaceutical purposes.

In the Edinburgh Royal Infirmary, during the year 1858, the total number of admissions was 3718, and the average daily number of patients was 324. The total expenditure upon wine and spirits was 479*l.* 11*s.*

Lastly, at the London Fever Hospital in 1856, the total number of cases admitted was 1882, of which 1062 were examples of typhus. The sum spent upon wine and spirits was only 167*l.* 15*s.*

Having made these remarks upon Dr. Todd's general principles of treatment, which we have done in no spirit of animadversion upon his memory, but with a sincere desire to arrive at the truth, we now proceed to take a brief notice of the subjects discussed in the present volume of Clinical Lectures. The first three lectures are devoted to rheumatic fever, and will be perused with no small interest and instruction by every practical physician. Case II. is that of a girl, aged sixteen, affected with rheumatic fever, in whom pericarditis, and probably also inflammation of the endocardium and of the pleura, supervened, *whilst the patient was in a state of salivation from the early administration of mercury* before admission into hospital. Dr. Todd tells us also that he has met with other instances of a similar nature.

Dr. Todd, like most other physicians, regards rheumatic fever as due to a *materies morbi* (lactic acid?) in the blood. This *materies morbi* is the result of a vitiated state either of primary or of secondary assimilation, or of both, and the parts where it accumulates are just those which, while they are highly vascular and therefore contain a large quantity of the diseased material, present the least obstruction to its escape from the circulation. These are the delicate synovial membranes of the joints, the serous membranes, and the lining membranes of the heart and of the pulmonary air-cells, parts where the bloodvessels are naked, or covered by but a film of membrane. These several parts pour out a secretion which, in place of being alkaline, as in health, is decidedly acid; and at any one of these parts the morbid matter may excite inflammation. The morbid matter also irritates the sweat glands, and is eliminated in large quantity by the profuse sweats characteristic of the disease, while the abundance of lithic acid found in the urine indicates that the functions of the kidneys are similarly affected. Hence it is argued that the more the elimination of the *materies morbi* is encouraged at the skin, at the kidneys, and at the mucous membrane of the alimentary canal, the less chance is there of pleurisy, pneumonia, pericarditis, &c.

In the treatment of acute rheumatism, Dr. Todd says our objects should be: 1. To relieve pain; 2. To strike at the root of the malady; 3. To cure the patient with as little trial to his constitution as possible; and 4. To secure for him a short convalescence. Seven different methods are enumerated which have been proposed for the treatment of acute rheumatism 1. Venesection; 2. Diaphoretics; 3. Mercury; 4. Colchicum and guaiacum; 5. Opium; 6. Large doses of bark; and 7. Treatment by elimination. All of these plans of treatment Dr. Todd endeavours to show to be useless or positively injurious, with the exception of the treatment by elimination in combination with opium. It is admitted that in certain cases where the sweating is colliquative and the urine copious and pale, with abundant precipitates of *pale* lithates, great good may be done rapidly by the use of quinine; but it is thought that if this treatment be adopted from the beginning it may check secretion, and so favour the development of internal inflammations. Dr. Todd's treatment by elimination consists in the use of antacid remedies, in giving large quantities of fluid for the free dilution of the *materies morbi*, in promoting the action of the skin, the kidneys, and the bowels, and in supplying the waste caused by diaphoresis and diuresis by nourishing food and alcoholic stimulants. The alkali recommended is the bicarbonate of potass—a scruple or half a drachm every third hour—and along with this Dr. Todd was in the habit of prescribing powders containing five grains of nitre, one grain of opium, and one grain of ipecacuanha. The affected joints are to be enveloped in cotton wool with oil-silk externally, and in some cases much benefit will be derived from the application of sinapisms followed by repeated blisters, not exceeding a crown piece in size. When the heart or any of the internal organs becomes affected, Dr. Todd insists much upon the impropriety of bleeding, whether general or local, a practice which is considered as altogether unsatisfactory in its remedial results, and prejudicial in its consequences. Blisters should be applied locally, the plan of elimination is to be persisted in, and the influence of opium is to be kept up. Delirium, which may or may not usher in and accompany the internal inflammations, is described as a very formidable complication of rheumatic fever, and is thought to depend upon a deficient supply to the brain of blood depraved in character. It is therefore to be treated not antiphlogistically, but by a liberal use of alcoholic stimulants and nourishing food, and by checking profuse sweating, or any other too free evacuation. Opium is to be prescribed if the patient be wakeful, but is to be abstained from if there be a tendency to coma. The brain in such cases is described as poor in blood, and resembling that of an animal bled to death. When, in rheumatic fever, the patient begins to pass pale urine, in good quantity, either without precipitate or with a greater or less quantity of pale lithates, he will almost invariably be the better for a more generous treatment, even though the articular affection continue troublesome. Under such circumstances, ammonia, quinine, wine, and brandy will often effect rapid improvement. Such is an abstract of Dr. Todd's mode of treatment of rheumatic fever, under which it is stated that the duration of the disease seldom exceeded from ten days to three or four weeks; relapses were of rare occurrence, and the accidental complications of the disease—pneumonia, pericarditis, and delirium—were less frequent and formidable than under any other system.

In the next two lectures (IV. and V.) the subject of continued fever is discussed. The different forms—typhus, typhoid or pythogenic fever, and the relapsing fever—are recognised, but the remarks in these lectures are confined to the two former. Although, in one place, Dr. Todd admits that these different fevers result from the absorption into the system of different poisons, at another place he speaks of them as merely *clinical varieties*, which it is sometimes impossible to distinguish, and many of the observations appear as if they had been written under the impression that all the forms were merely varieties and not different species of disease. It must be confessed that the clinical distinctions between typhus and typhoid fever, as portrayed by Dr. Todd, are so meagre and imperfect, that, using them for our guide, it would sometimes be impossible to say to which of the two forms a case belonged. One case (XXVI.) is detailed in which a "well-developed rubeoloid eruption" and "rose spots" coexisted in the same individual, and in which enteric symptoms were also present. The details of the case are scarcely sufficient to form any opinion as to the real nature of these two eruptions, except from the names bestowed upon them, but there seems reason to doubt if the so-called rose spots were really the eruption characteristic of typhoid fever. They are described as appearing on the sixth day of the fever, thickly scattered over the belly and chest. No further mention is made of them, but two days later a measly eruption was fully developed on the chest, belly, and back. Now, it is seldom that the rose-coloured spots of typhoid fever appear so early as the sixth day, still less that on that day they should be "thickly scattered;" and they never come out all at once and then disappear. It is their character to appear in successive crops during the whole course of the fever, each crop lasting for three or four days; yet in the case alluded to no mention is made of them after the sixth day. Again, it is exceedingly rare for the measly eruptions of typhus to be delayed so late as the eighth day of the fever. Out of upwards of a hundred cases in which this point was carefully noted by the writer, in not one could it be said with certainty that the eruption was delayed later than the sixth day. Lastly, the measly eruption of typhus at its first appearance sometimes consists of isolated spots, which at first sight might be mistaken for a copious rose-coloured eruption. It seems highly probable that the case alluded to was an example of typhus complicated with diarrhœa. At the same time, the possibility of the co-existence of the two eruptions is not denied. It has been shown by Dr. Murchison that, contrary to the generally received opinion, the poisons of typhus and typhoid fever, like those of typhoid and scarlet fever, scarlet fever and measles, and indeed of any two of the exanthemata, may co-exist in the same individual.*

Dr. Todd justly observes that one of the most palpable and unequivocal signs of an enfeebled circulation in the course of fever is a marked deterioration in the quality of the pulse on the patient's assuming the semi-erect from the horizontal posture. It indicates very clearly how dangerous it is to remove patients in fever from one place to another, or to allow them to move themselves, and how necessary for them it is that they should be constantly attended upon, that every, even the slightest, exertion on their parts should be prevented as much as possible.

Meteorism in continued fever is, according to Dr. Todd, the result of defective nervous influence, and is not, as is commonly supposed, peculiar to typhoid fever, in which the intestines are diseased, but is, on the other hand, of more frequent occurrence in typhus. This statement is opposed to the experience of most observers. In 2 only out of 40 cases of typhus, has the writer found the abdomen to be abnormally distended, and of 41 fatal cases of typhus, Dr. Jenner observed this condition in only 3. On the other hand, meteorism is a symptom which, in a greater or less degree, is seldom absent in typhoid or pythogenic fever. Of 46 patients who died of typhoid fever, meteorism was observed by Louis in 34. We are the more at a loss to account for the statement just quoted, inasmuch as a careful study of Dr. Todd's hospital case-books shows that the cases, as reported, correspond entirely with the experience of other observers.

Case XXV. is an example of typhus in which death was preceded by convulsions, and where the kidneys were found slightly granular. An opinion is expressed that the head symptoms were due, not to uræmic, but to the typhus poison. It does not appear that Dr. Todd was aware that in almost every case of typhus in which death has been preceded by convulsions, and where the kidneys have been carefully examined, these organs have been found diseased.

Dr. Todd was one of the first to point out that the delirium and the coma, which are of such frequent occurrence in continued fever, are not due to any inflammatory or congested condition of the brain or its membranes, but that they must rather be looked upon as the result of that perverted nutrition which is the necessary consequence of the poisoned condition of the nutrient fluid. The sub-arachnoid effusions which we meet with now and then after fever are not of an active kind. They are the result of a certain shrinking of the brain, fluid being poured out to fill up space. This fluid, according to Dr. Todd, exercises no more than the normal pressure which seems a necessary condition of the brain's nutrition, and is not instrumental in the production of comatose symptoms.

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* British and Foreign Medico-Chirurgical Review, July, 1859, p. 178.

Perhaps there is no better proof that typhoid fever is an idiopathic fever, and that the febrile symptoms are not, as has been maintained, dependent upon the intestinal lesion, than the circumstance which has been pointed out by Jenner and others, that there is no relation whatever between the severity of the fever and the extent of the local disease. Dr. Todd tells us that he has seen as great prostration when there were only four ulcers in the intestine as when these were most numerous; and it is well known that the head symptoms are quite independent of the intestinal disease. Such being the case, we are scarcely prepared to admit the force of Dr. Todd's arguments, which are expressed at some length, in order to prove that the prostration and head symptoms observed in typhoid fever are due to the absorption of pus into the blood, or to "purulent infection." In many cases of typhoid fever with extensive ulceration, there is no great prostration, and no head symptoms whatever; and in typhus fever we have a greater degree of prostration and head symptoms more frequent and more marked, and yet there is no ulcerated surface from which pus can be absorbed. The entrance of pus into the circulation no doubt often gives rise to symptoms closely resembling those of typhoid fever, but surely it is not necessary to attribute the head symptoms in typhoid fever to pyæmia, any more than it is in the case of typhus.

It is too commonly believed that the chief distinction between typhus and the so-called typhoid fever is the presence of diarrhœa in the latter disease. It must not be forgotten, however, that true typhus is occasionally complicated with diarrhœa, although no ulceration of the bowels exists; and again, cases of typhoid fever are occasionally met with which run their course and prove fatal without the occurrence of any serious diarrhœa, and yet, on making a post-mortem examination, very extensive ulceration is found in the ileum.

Dr. Todd, like most modern physicians, maintains that we cannot cure a fever, that we cannot cut it short, and that all we can do is to guide it through its several stages, and uphold the vital powers of the patient until the influence of the poison is worn out. This he thinks is best done by alcohol, by diffusible stimulants (ammonia and chloric ether), by nitrogenous food given as broths, and by carbonaceous food selected from the farinaceous substances. The objections raised by some practitioners to the use of stimulants is ascribed to the slovenly mode in which they are too often given. They must be given in frequent small doses, and not in large doses at one time. There are few who will not assent to the propriety of administering stimulants in the course of most cases of continued fever, more especially of typhus. As already observed, the peculiarity of Dr. Todd's treatment consisted in the *amount* of stimulants he was in the habit of prescribing. One case is mentioned in which an ounce of brandy was given every half-hour, and we have authority for stating that even this quantity was frequently exceeded. It is true that Dr. Todd states that there are many cases of fever in which no stimulant at all is necessary. In practice, however, we know that Dr. Todd made no such exceptions, except in cases of simple fever or febricula. He was in the habit of prescribing stimulants largely in all well-marked examples of typhus or typhoid fever. Although the experience of most observers, throughout all ages, would show that stimulants are far more beneficial and called for in typhus than in typhoid fever, Dr. Todd made no such distinction.

The author only expresses a universal opinion when he says that if there is any reason to believe the small intestines ulcerated, or likely to become so, in the course of fever, mercury must be eschewed. In Dr. Todd's experience, nothing was so effectual in restraining hæmorrhage from the bowels as turpentine given in small doses internally, and also applied externally over the abdomen in the form of stupes. We quite agree with him in this and also in the propriety of abstaining from purgatives in typhoid fever. When the bowels are once fairly locked up, they should be kept so. Patients will go for four or six days, or even longer, without suffering inconvenience from this state of constipation.

Lecture VI. is devoted to erysipelas, and Lecture VII. to erysipelas of the fauces.

It is well known that an attack of erysipelas frequently begins with vomiting. To such an extent did this obtain in Dr. Todd's opinion, that whenever he met with a patient who had been suddenly taken with vomiting, and this vomiting accompanied with, or preceded by rigors, he deemed it expedient to watch carefully for erysipelas.

Erysipelatous bronchitis Dr. Todd considered to be a complaint of more common occurrence than is generally supposed. It is accompanied by great prostration, and has a very fatal tendency. When this malady terminates fatally, it generally does so by inducing that condition which, since the death of the Emperor Nicholas of Russia, has been so much talked about as *paralysis of the lungs*,—a term intended to express that state of things which occurs when the air passages become choked with muco-purulent secretions, which the patient is too much exhausted to expectorate.

Dr. Todd's treatment for erysipelas is precisely the same as that for continued fever:—beef tea, brandy, ammonia, bark, and chloric ether. "In all severe examples of the malady, place your trust in food and brandy, from the very commencement of the attack." Erysipelas has long been removed from the category of ordinary inflammations, and there are few practitioners at the present day who would dream of treating it by antiphlogistics, although a perusal of Dr. Todd's lectures might lead one to believe that such treatment was far from uncommon. It is long since Dr. Williams, of St. Thomas's Hospital, recommended port wine, Dr. Budd large doses of carbonate of ammonia, and Mr. Hamilton Bell the tincture of sesquichloride of iron, in the treatment of this affection.

The following is Dr. Todd's opinion as to the utility of the sesquichloride of iron in erysipelas, as recommended by Mr. Hamilton Bell, of Edinburgh:*

> "I have no doubt many cases, such as those that will get well of themselves, will get well under that drug, partly and mainly because it excludes depressing treatment, partly perhaps from some tonic power in the medicine; but I would as soon think of trusting to it in the treatment of the more severe forms of the disease as I would to the billionth of a grain of aconite, or arnica, or sulphur, or any other homœopathic absurdity. The remedy, so far as I know, is unobjectionable in itself, but its power to do good is small; and if you try it, let me advise you not to trust to it alone, but merely to use it as an adjunct to the treatment, which I have already endeavoured to impress upon you. For, as I before said, there is a large class of cases of erysipelas which will get well without any treatment whatever, and indeed, in spite of depressing treatment, either because the dose of the poison which these patients have imbibed has been very small, or because their powers of resisting acute disease are very great. In such cases you may, if you like, amuse yourselves with giving a remedy of the nature of sesquichloride of iron."

When the erysipelas gives rise to œdema-glottidis, Dr. Todd urges the propriety of at once performing tracheotomy. "The sooner the operation is performed the greater probability will there be of your saving the patient's life." After the operation, the patient is to be well supplied with food and stimulants as the only means of saving life. The lecture on Erysipelas of the Fauces is perhaps the most important in the volume.

> "The force of the poison seems to fall upon the pharynx and to paralyse it, and it must do this either by benumbing the sensitive nerves, through which the muscular contractions are usually excited by the contact of food, or by extending to the muscles themselves and paralysing them directly, or it may be in both these ways. If you look into the throat of a patient labouring under this affection, you will find the pharyngeal mucous membrane exhibiting a peculiar dusky red colour, the fauces will be perfectly open, and you will be unable to discover any mechanical impediment to free deglutition; and if now, with your finger, or a pen or probe, you touch the back of the pharynx, you will find that none of the pharyngeal muscles are thrown into action, as they invariably are in a state of health—in other words, you cannot excite the reflex actions necessary for deglutition; and if you give the patient something to swallow, as soon as he gets the liquid or solid, whichever it be, upon the back of the tongue, instead of its being grasped by the contraction of the muscles of deglutition, and guided, as it were, into the œsophagus, in consequence of the complete palsy of these muscles it falls by its own gravity into the larynx, and is thence immediately ejected, by a powerful expulsive effort, through the mouth and nostrils. . . . . In these cases the patient is apt to die, not from want of air but from want of food."

The treatment recommended consists in the administration of enemata of beef tea and quinine, while the fauces are to be lightly touched with solid nitrate of silver. As soon as the power of swallowing returns, frequent and large doses of brandy, ammonia, chloric ether, and beef tea are to be given by the mouth. If the power of deglutition does not return within forty-eight hours, recourse must be had to the stomach tube.

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* Edinburgh Monthly Journal of Medical Science, p. 497, June, 1851.

Lecture VIII. is on the "Treatment of Acute Internal Inflammations." The lecture is founded on a case of rheumatic fever complicated with double pneumonia and pericarditis. It contains a *résumé* of Dr. Todd's principles of treatment in acute internal inflammations, and after what has already been said, need not further occupy our attention.

Lecture IX. is upon the subject of Pyæmia. Cases of pyæmia are divided into three classes. 1. Cases in which death results in two or three days, or even less, from the first circulation of pus in the blood, and where it is due to a poisonous influence acting upon the nervous system rather than to the occurrence of local mischief. 2. In a second class, the result is no less fatal; but the course of the malady is extended over a much longer period of time, deposits of pus taking place in the joints and internal organs. 3. The third class of cases is much less fatal, the deposits of pus taking place in the cellular tissue and muscles, and the principal danger consisting in the liability of the lungs to become involved. The various causes of pyæmia are pointed out, and the theory of the disease is discussed. The treatment of these cases may be summed up in one word—*support*.

The next four lectures (X., XI., XII., and XIII.) are upon pneumonia. These lectures were apparently delivered at long intervals. They contain many needless repetitions, while the whole matter might with propriety have been re-arranged and condensed prior to publication. The author distinguishes five clinical varieties of pneumonia—viz., 1. *Simple pneumonia*, which is uncomplicated with disease of any other organ, and which occurs in a subject who possesses no marked peculiarity of constitution, such as the gouty or rheumatic diathesis. There are few cases, however, it is observed, in which the pneumonia is not complicated with pleurisy, and few also in which there is not some peculiarity of constitution, which may determine more or less the access of the pneumonia, and influence its duration and mode of termination. 2. Pneumonia complicated with *acute gout*, or with *rheumatic fever*, or associated with a decided gouty or pneumatic diathesis. This form is stated to be of very common occurrence. 3. *Strumous pneumonia*, or pneumonia connected with the development of tubercles in the lungs, or occurring in subjects of a strumous constitution, without any evidence of tubercular deposits in these organs. This form is described as frequent in strumous children, and as probably often mistaken for phthisis. 4. *Typhoid pneumonia*, by which is meant inflammation of the lung coming on in a low state of the system, and associated with a series of typhoid symptoms, such as great prostration, a brown tongue, and a languid and feeble condition of the circulation, or specially connected with either typhoid or typhus fever. 5. *Traumatic pneumonia*, which succeeds and is consequent on injuries to the chest or severe surgical operations. The *lobular pneumonia* of young children, Dr. Todd, in common with others, believes to be not pneumonia at all, but merely a state of carnification due to the exhaustion of air from parts of the lung by the excessive expiratory efforts which occur in these cases. Dr. Todd objects to the classification of pneumonia into sthenic and asthenic cases, as being of any service for determining the adoption or non-adoption of antiphlogistic remedies.

> "Some physicians have drawn a distinction between cases of pneumonia, which is useful with reference to treatment. There are, they say, two classes of cases of pneumonia, the one sthenic, the other asthenic and typhoid, the former capable of bearing the most active antiphlogistic treatment, and for which, indeed, they say that that treatment is absolutely necessary; the latter requiring a supporting and even a stimulating plan, and for which an antiphlogistic one would be extremely hazardous and dangerous. Now, while I fully recognise and admit the practical value of such a distinction as this, I must remark that it seems to me it ought to be expressed differently. I would say, that in all cases pneumonia has, independently of this or that mode of treatment, a decided tendency to depress the general powers of life—in some more, in some less; that with all, a very decided direct antiphlogistic treatment is hazardous—with some extremely so—and in none is it absolutely necessary; but with others there is no safety for the patient, unless the treatment from the beginning be of a decidedly supporting and stimulating nature."

Dr. Todd confirms an observation already made by others, that when the pneumonia is seated in the upper lobes, the chances of recovery are much less than when it occupies the lower lobe. This, he says, is a clinical fact highly deserving of attention, and which ought to exercise an influence upon treatment. The greater danger of the disease under such circumstances is ascribed partly to its being of a more asthenic nature when it attacks the upper lobe only, and partly to the fact that this part is most apt to be affected in old persons. It is worthy of notice, that in pneumonia of the apex there is very often a total absence of expectoration.

Dr. Todd mentions a small patch of herpes at one angle of the mouth as a very common phenomenon in pneumonia, and for some reason which he was unable to explain, as generally of favourable import.

Some very interesting observations are contained in these lectures, showing the absence of chlorides from the urine, and their presence in the sputa of pneumonia. These observations are well deserving of perusal. The investigations of Redtenbacher, Beale, and Dr. Todd render it probable that the chlorides and other fixed salts which are naturally voided in the urine are in pneumonia attracted towards the inflamed lung. No sooner does the attracting force set up by the inflamed lung cease to operate, than the chloride finds its way out of the system through the ordinary channel.

In the treatment of pneumonia, Dr. Todd recommends remedies which promote the free action of the skin and of the kidneys, and in a less degree that of the intestinal mucous membrane, whilst at the same time a free stimulation, by means of turpentine stupes, &c., is maintained of that part of the skin which is near the seat of the pulmonary inflammation. It is allowed that tartar emetic, when given in such doses as not to cause vomiting or purging, or too great a depression of the powers of the system, may be a very safe and useful remedy. From the difficulty, however, of limiting its action in this way, Dr. Todd recommends in preference such remedies as the liquor ammoniæ acetatis, which, like tartar emetic, tend to produce free sweating, but which, unlike it, exercise no depressing influence upon the patient. These remedies are to be given in large (four, six, or eight drachms) and frequently-repeated doses. An essential part of his treatment was that,

> "While these remedies are being used, we do not aim at reducing the general powers of the system, but rather at upholding them by such frequent supplies of nourishment, easy of assimilation, as may be readily appropriated, and duly apportioned, both in quality and quantity, to supply the waste which during the inflammatory process must necessarily take place in the most important tissues of the body, especially the muscular and nervous."

Beef-tea and "*alcoholic food*" are the principal nutritious substances here alluded to. This alcoholic food was usually given in large quantities. In Case LXIV., twenty four ounces of brandy were administered in the twenty-four hours, and we have reason to know that even this quantity was sometimes exceeded.

The results of Dr. Todd's treatment of pneumonia have been already alluded to.

The fourteenth and last lecture is on the therapeutical action of alcohol, and is founded upon the case of a child aged three, who died from an over-dose of gin, and in whose body after death no signs of inflammation or of congestion could be detected. From this case it is argued that we may discard the popular prejudice that alcohol causes inflammation, and that therefore it ought not to be given in inflammation. Among the symptoms, however, which followed the use of the gin were coma, convulsions, vomiting, and extremely rapid pulse. It is argued that these symptoms and the fatal results in this case were due to a large quantity (2½ ounces) having been swallowed *at once*. It is maintained that the successful administration of alcohol in acute diseases depends very much on its *mode of administration*, and that there is a great difference between swallowing a large quantity at once, and taking the same quantity in frequent divided doses. It is allowed that alcohol, "if given in excess, either by large doses at once, or by too frequent doses, tends to produce coma." We must confess, however, that we can scarcely imagine even the most confirmed drunkard taking larger or more frequent doses of brandy than half-an-ounce every half or even every quarter of an hour, such as Dr. Todd was frequently in the habit of prescribing in acute diseases. It can scarcely be believed that the administration of such large doses of brandy was not in many instances followed by injurious consequences, and we know that many of Dr. Todd's patients have declared that they were positively unable to comply with his injunctions as to the frequent doses of brandy to be taken in even chronic diseases. May not the absence of injurious effects which in many cases has followed the use of large quantities of brandy, be accounted for on the supposition, that owing to the debilitated condition of the organs of digestion, but a small portion of it was taken up into the system?

In what has just been written we have endeavoured to place before our readers a brief digest of the more important matters contained in these lectures of Dr. Todd upon acute diseases. It must be obvious that Dr. Todd was in the strictest sense a humoral pathologist. He seemed to consider that all acute diseases were due to the presence of some poison in the blood, and that the main object in treatment should be to get rid of this poison, or to *eliminate* it from the system; while from the commencement supporting measures were to be adopted, with the object of anticipating and preventing depression of the vital powers. There are many reasons for believing, that in most of the diseases which Dr. Todd selected for these lectures, with the exception of pneumonia, a poison does exist in the blood; but to make the whole phenomena of acute diseases hinge upon this poison, and to apply this doctrine to all acute diseases indiscriminately, are surely very narrow views of the aims of pathology and therapeutics. It is somewhat surprising that such an eminent physiologist as Dr. Todd should have assigned such an insignificant place to the nervous system in accounting for the phenomena of acute diseases.

We fear that Dr. Todd's writings will convince few members of the profession, except those who may have imbibed their first notions of what is right or wrong under his tuition, that antiphlogistic remedies are in all cases so ütterly worthless—nay, positively injurious—as he would have us believe. Into this subject we cannot at present enter, but we would refer the reader to a very able letter from the pen of Dr. Symonds, of Bristol, which appeared in the 'Medical Times and Gazette' for April 7th, 1860, and which deserves the attentive perusal of every one of Dr. Todd's disciples.

But, as has already been stated, the peculiarity of Dr. Todd's treatment of acute diseases consisted, not in abstaining from antiphlogistic remedies, but in administering large doses of alcoholic and other stimulants from an early period of the disease. It has been shown that there was no novelty in this treatment, that it was but the revival of a treatment which more than half a century ago held its sway for a brief period of years. Moreover, it has been shown that the results of Dr. Todd's own treatment were certainly not such as to encourage any one to believe that the method of treatment which he advocated was superior to every other, while in some instances it may be doubted if it was not positively injurious.

REVIEW III.

Norsk Magazin for Laegevidenskaben, 1856, 1857, 1858, 1859.—*Christiania.*

Norse Magazine of Medical Science.—Christiania.

WE have repeatedly in this journal directed the attention of our readers to the labours of our Scandinavian brethren in the cause of science, and have done justice, we hope, to their ardent zeal and perseverance in the investigation of controverted points in medicine. Some years ago (October, 1853) we noticed several articles in the earlier numbers of the journal now before us, and since that time, almost all that has appeared upon the peculiar diseases of Scandinavia, or relating to modes of treatment specially pursued there, has been drawn from the same source. It appears in monthly numbers, and is edited by Munster, Faye, W. Boeck, Lund, and Voss, all names more or less known to science. A portion of this magazine is devoted to the publication of original articles, while copious extracts and condensations from papers by foreign authors are carefully given. The reports, too, of the monthly meetings of the Medical Society of Christiania are here regularly published; not mere short abstracts of the discussions that have taken place, but full and complete as our own newspaper reports of parliamentary proceedings. Much of the curious information regarding the endemic and epidemic diseases of Norway, which has from time to time appeared in this journal, has been gleaned from these proceedings of the Christiania Medical Society. This is indeed the only medical journal published in Norway, and it owes its support to the medical practitioners scattered over the face of this thinly-inhabited country, or concentrated in the two or three towns along the coasts. The population of all Norway does not equal the half of that of London, and as the majority of the inhabitants lead a pastoral life, separated from each other by wide tracts of desert mountains, money is exceedingly scarce, and few practitioners would find it worth their while to settle in country districts. To remedy this the Norwegian Government has appointed district physicians in the various provinces, supporting them by an annual stipend, in addition to the remuneration they can obtain from the inhabitants. The districts to which these men are appointed are often of extraordinary extent; a journey of fifty or eighty miles is of no uncommon occurrence, but to accomplish it the practitioner has to encounter difficulties unknown in more cultivated and more easily traversed lands. These district physicians are almost all of them highly-educated men, and much of the valuable information relative to disease prevalent in certain parts of Norway has been obtained through their exertions. In Norway, the trade of the chemist and druggist is wisely separated, as it is everywhere but in England, from the profession of medicine. In outlying districts, however, this enactment is dispensed with, but still the practitioner is remunerated for his visits, and not according to the quantity of drugs he has sent to the unfortunate patient. The sole medical school in the country is at Christiania, in the well-ordered University of that capital, and here, too, we have the chief hospitals (excepting the great hospitals for lepers at Bergen), and every requisite for forming a well-instructed body of practitioners. It is in Christiania too that the Medical Society of Norway holds its monthly meetings, which are regularly reported in the "Norwegian Medical Journal." Some idea may be formed of the activity of this Society from the fact that in 1857 this Society held no less than thirty meetings, fourteen of which were extraordinary ones, with an average attendance of twenty-five members at each. The cause of so unusual a number of meetings being held in that year was that two subjects of great interest, not only for Norway, but also for the whole scientific world, were under discussion, and it was desirable that these questions should be debated at full length and without interruption. The results of these meetings have been already given to the readers of this journal, in the articles on "On Syphilization, and on the Hereditary Transmission of Leprosy." Three whole meetings were devoted to the controversy about syphilization, and not less than thirteen to that of leprosy. During the discussion on the latter subject, one of the members of the Society, Egeberg, offered a donation of 1800 dollars towards the employment of a competent person for two years to investigate the spread of this fearful malady on the western coast, where it prevails; in one of the most recent numbers of the journal that has come to hand, we find the results of Candidat Bidenkap's researches, and which tend to confirm the opinion that the malady is actually increasing in certain localities. The approach of cholera and the means of warding off its invasion, has likewise been brought frequently before the Society, and on this subject, as well as in many other cases, it is pleasing to find how thoroughly the experience of other countries, and especially that of England, is appreciated by our Scandinavian brethren. By some the Society might be thought to be going beyond its limits when we find it undertaking the inspection of a water-cure establishment near Christiania. In England, and in many other countries, this really valuable method of cure in certain diseases has been unfortunately allowed, for the most part, to fall into the hands of men not actuated so much by scientific zeal as by the desire of obtaining patients; or they are directed by enthusiastic specialists, who blindly subject all diseases to one method of treatment. It is greatly to be regretted that in this way the profession has been more or less precluded from availing themselves of this new system, if it deserves the name, and the same may be said of the now fashionable gymnastic medicine or movement-cure, which, under proper safeguards, might really produce important results. Among the valuable series of reports which have from time to time appeared in the "Norwegian Medical Journal," there are few that are more satisfactory, none that evince greater care and diligence in preparation, than those of Professor Faye upon the Lying-in Hospital of Christiania. These reports embrace a period of thirty-six years, from the foundation of the hospital to the year 1854. To the contents of these reports we propose now to call the attention of our readers. Professor Faye has only been attached to the hospital during the last fourteen years, or since the year 1846; he has annually, up to the year 1854, issued regular reports upon the state of the institution. Since the latter date he has published several important monographs upon diseases connected with the puerperal condition. The hospital was founded in the year 1818, but no reports were issued until Professor Faye assumed the direction; nor were the books so accurately kept as to enable him to give a satisfactory account of the institution up to the date of his appointment. Indeed, although the maternity wards existed, there was no separate building appropriated for this special purpose until the year 1837, when it was removed to a house adjoining to and within the grounds of the general hospital. Since then this separate building has been almost annually improved and altered in accordance with the suggestions of Professor Faye, but he is still of opinion that it requires material changes to bring it up to the standard of the great maternity hospitals in other parts of Europe. The average annual mortality of the institution from 1818 to 1846 has been 1 in 47, but in some years there were actually no deaths at all; as in 1834, with 266 patients, and again, with 158 inmates in the year 1838. To counterbalance this, there have been several years where the mortality has been above the average: thus in 1828, the deaths, omitting fractions, were 7 in 125, or 1 in 18; in 1839, 7 in 132, or 1 in 19; in 1842, 12 in 176, or 1 in 14. During the ten years from 1826 to 1836, the mortality was only 1 in 61, while in the succeeding decade—1836 to 1846—it was 1 in 40. Dr. Faye explains this increase of mortality by the circumstance that while the hospital became more frequented, no corresponding extension of the premises was made for those who sought shelter there, so that the number of cubic feet of air for each individual was proportionately diminished, while the requisite cleanliness, so essential in all hospitals, but especially in these particular institutions, could not be maintained.

The Maternity Hospital of Christiania is not, as in some kindred institutions in this country, wholly appropriated to the reception of pauper patients. Several apartments in the building are reserved for those who pay a moderate sum for treatment, while one or two rooms are reserved at a still higher rate, and of course are provided with more luxuries. In 1847, the year in which Dr. Faye issued his first report, the number of patients admitted was 203. The mortality was only 2, or 1 in 101. The births were 203, among which twin births occurred twice. Of the patients admitted, 72 were married, and 131 single women. It is of course to be expected, that in a town like Christiania, immorality will exist to a considerable amount, and that the number of illegitimate births will be large, but we must also remember that a great number of these births occur among the poor and destitute, precisely such as would be most likely to seek the shelter of the Maternity Hospital. We fear, however, that the morality of Norway, so highly extolled by Laing and other writers, in comparison to the amount of crime in Sweden, must be taken at a considerably lower standard than it is placed at by these writers. The recent researches of that admirable philanthropist, Eilert Sundt, upon the statistics of marriages and births, and also on the moral condition of the peasantry of Norway, have revealed an amount of immorality never before suspected. At some future period we hope to be able to give an analysis of the two valuable works of this author, 'On Marriages in Norway,' and 'On the Moral Condition of Norway,' both of which volumes contain valuable documents and researches, and yield results interesting alike to the moralist and the man of science.

In 1847, there were only 4 cases in which the aid of the forceps was required. Dr. Faye remarks that the employment of instruments to facilitate delivery varies greatly in different countries, and we may add in the practice of individuals in each country. He cites in proof of this Dr. Ramsbotham's statement, that he only used the forceps once in 729 cases of labour. Dr. Faye suggests that in England we are accustomed to regard the use of instruments in childbirth as of so great importance that we do not employ them till after consultation with a colleague; while on the other hand we undertake perforation of the head without the smallest hesitation. We do not think this reproach altogether merited, for we suspect that consultations are quite as frequently held about the propriety of perforation of the head, as in the case of employing the forceps. We cannot, however, deny that in England the life of the child is looked upon as of less moment than it is in any country in Europe, and by many practitioners it seems hardly considered to have a separate existence until its complete separation from the mother. Moreover, the induction of premature labour seems to be less employed in this country than elsewhere, and yet by this means much danger to the mother and the almost certain destruction of the child may in most cases be averted.

On the subject of removing the placenta by force in hæmorrhage after delivery, Dr. Faye tells us that he avoids as much as possible all manual interference, and endeavours to arrest the flow of blood by compression of the aorta, until the contractions of the uterus have so far loosened the placenta that a free portion of it can be laid hold of and brought down to the os uteri. By this delay he seeks to give the large open vessels on the surface of attachment time to contract and to fill up with coagula, whereby we may escape the dangerous suppurative process that occasionally ensues, and is often, as he thinks, favoured by the access of air to the uterine surface. Of course there are cases where the direct danger from hæmorrhage is so great, that the placenta must be detached by force immediately.

In 1847, puerperal fever prevailed in two wards tenanted by patients of the poorest class, and where the requisite hygienic precautions, especially as regarded an adequate supply of air, could not be carried out. Out of 62 cases, 57 occurred in these crowded wards, while only 5 cases were observed in the better ventilated apartments.

Whenever the ordinary wards became over-crowded, puerperal fever was sure to make its appearance, and with the diminution of the number of patients its ravages abated. With the exception of hospital gangrene and erysipelas, no malady seems to depend for its extension so much upon bad air as the one in question. The symptoms of the puerperal fever of this year did not present any remarkable variations from its ordinary character. Dr. Faye insists much upon the insidious character of the malady; he remarks that it constantly creeps on with but little outward manifestations till it suddenly breaks out into the fully developed disorder. He rarely has found the discharge of the lochia, or the secretion of milk, arrested when the disease did not show itself till two or three days after these secretions had been established, but if the disorder appeared before the lacteal secretion, the latter was at times wanting altogether. In all his reports he is strongly opposed to the theory of Helm and others, that pyæmia is the sole cause of puerperal fever; he maintains that in many cases the germs of this disease, the peculiar dyscrasis of the blood, existed *before* delivery was accomplished. Moreover, this peculiar condition of the blood often manifests itself by the deposit of plastic lymph in the veins without any tendency to the formation of pus. At a later period we shall return to this portion of our author's remarks, but before doing so we shall briefly analyse the reports of some of the succeeding years.

In 1848, 194 patients were received into the hospital, and the births were 189. The mortality of this year was above the average, 6 in 104, or 1 in 32. The forceps had been used in three of the fatal cases. Another case died of rapid phthisis after delivery. Although Professor Faye does not believe in the transmission of infection by contact to the extent that is admitted by many in England, yet, as a precautionary measure he always advised the washing of the hands in a solution of chloride of lime or chloride of zinc between each examination. In one of the fatal cases of puerperal fever there was a protracted labour necessitating the employment of the forceps. The placenta, which came away two hours and a half after delivery, was more or less in a putrid condition, and the child was dead. The febrile symptoms showed themselves a few hours after, and the patient died on the fourth day. Peritoneal inflammation, with purulent exudation, was found in the abdomen, and the uterus was lined with an extremely fœtid blackish-green deposit. The patient's death could hardly be attributed to any epidemic influence, as none such then prevailed, the blood poisoning had no doubt originated from the inner surface of the uterus, and especially from the placental attachment where the dark fœtid layers were thickest. Dr. Faye believes that in this case the morbid changes in the blood had commenced during pregnancy, but that they were only fully developed, as an exudative process, after delivery was accomplished, and that it was then impossible to arrest the progress of the malady. No active reactionary fever, as in true pyæmia, came on; it seemed to him as if this "ichor poison" so weakened the vitality of the system, that no reaction could be brought about. We think ourselves that in many cases of pyæmia the reactionary fever is very little marked, and these are often the most fatal forms.

In a second case death ensued from peritonitis, diphtheritis, phlegmasia alba dolens, and extensive sloughing of the cellular tissue of the nates and lumbar regions. This patient was also delivered with the forceps, and the discharges of all kinds were of the most fœtid character. The gangrene of the cellular tissue did not appear till fourteen days after delivery, and the patient died exhausted on the 28th. We have only space for the author's remarks on the disease and its results :—

> "In going through the history of this case from the commencement, the fetidity of the discharges at and after labour, the rigors in the second period of labour, and their return immediately after the child was born, render it probable that a morbid diathesis existed from an early period in the constitution, and especially in the uterine system. The slow progress of the labour called for the employment of the forceps, and manual interference was afterwards required to detach the placenta. Neither of these operations was attended with any peculiar difficulty, but both may have had a certain influence on the progress of the case. The frequent pulse and the persistence of the meteorism, even after the inflammatory action had in a great measure subsided, indicate a constitutional and not a mere local affection, and the seat of this must be sought for in the blood, which exhibited as usual a strong tendency to part with its fibrine and to become disorganized. This is shown, we think, by the affection of the pelvic viscera, by the attacks of diphtheritis, by the phlegmasia alba, and the destruction of the cellular tissue in the lumbar region. The post mortem examination showed that while the crural vein and the smaller veins opening into it were obliterated by fibrinous coagula, there yet remained through the centre of the coagulum a narrow passage allowing of a small continuous stream of blood; and this, with the collateral circulation, probably prevented complete stagnation, and its consequence, inflammation and perhaps gangrene. As the lining membrane of the obstructed veins was smooth, and the fibrinous coagulum was only in apposition to the walls without adhering to them, we may conclude that the latter was a direct deposit or coagulation from the blood, without any preliminary phlebitis." (p. 20.)

Dr. Faye observes that the inflammation of the veins, generally termed phlebitis, is often of a secondary character, and, as has been maintained by the leading German pathologists, is the result of stasis of the blood in the vessels. This stasis may partially depend upon mechanical obstruction during pregnancy, but along with it, he says, we cannot deny the existence of a peculiar dyscrasis of the blood, tending to fibrinous deposit.

A third case this year proved fatal from gangrene of the external organs of generation, accompanied with peritonitis. Speaking of another case, which likewise ended fatally by peritonitis, Dr. Faye remarks that great fetidity of the urine before and after delivery is always to be looked upon as a suspicious symptom, and as indicative of serious disorganization of the vital fluid, even though it is not accompanied by rigors.

It is in this year's report that Dr. Faye first refers to the employment of sulphate of quinine in epidemics of puerperal fever. He speaks of the drug here merely as a prophylactic, and refers to the experience of Dr. Folleville at Rouen, where out of 62 females in the Maternity Hospital 32 took sixteen grains of quinine daily, and of these only 2 took puerperal fever, while of the remaining 30 not less than 19 were affected. One case of induration of the cellular tissue in a new-born child occurred this year, and on dissection the umbilical vein was found filled with fibrinous coagula and pus.

In 1849, the number of patients was nearly as in the preceding year—i. e., 206. The births were 205, among which were two cases of twins. The forceps were only used once. The health of the inmates was somewhat better than that of the preceding year, and the mortality was less. Great changes were this year made in the arrangements of the hospital, and its premises and accommodation were considerably extended. Puerperal fever, of well-developed character, occurred in 15 cases, in nine of which there was peritoneal inflammation, and in two very fœtid lochial discharge. There were, in all, three deaths, and in two of these the local affection manifested itself, not in the uterine system, but in other organs. In the first case, an unmarried female of thirty-four years of age, there were symptoms of peritonitis very soon after delivery; but these symptoms subsided under treatment, though the lochial discharge continued fœtid. On the eighth day capillary bronchitis supervened, and proved fatal in a week. In reference to this case, Dr. Faye remarks how difficult it is during febrile affections or blood diseases to distinguish between capillary bronchitis, pneumonia, and œdema of the lungs. In a second fatal case the patient died of putrid sore throat, with diphtheritic deposit on the fauces. Diphtheritic complications seem to have exhibited themselves much earlier in Norway than in England, for it is only within the last four years that diphtheria has become again frequent in this country. We say again, because we are well aware of many fatal cases of this malady having occurred forty years ago in certain parts of England. The third fatal case was one where twins were born five weeks at least before their time. Bronchitis came on after delivery, accompanied by peritonitis, which proved rapidly fatal to the mother. She had indeed suffered from bronchitis before her delivery, and had undergone much misery and privation previous to her admission to the hospital. Dr. Faye believes that the puerperal state here increased the tendency to exudation and to fibrinous deposit from the blood. He found opium of much value in the treatment of puerperal affections, and especially in puerperal peritonitis; but it was far from being so efficacious in those cases where the malady came on with symptoms of asthenic depression, when the inflammatory symptoms were less decided, and the whole exhibited the character of blood-poisoning. When the lochial discharge was exceedingly fœtid, he found good results from injection of a solution of nitrate of silver or of the chloride of zinc.

"In examining the mortality of the last five years in the Maternity Hospital, we are struck with the remarkable difference between the average of deaths among the married and the unmarried inmates. Of 332, four died, but only one fell a victim to true puerperal fever. The three others died respectively of hæmorrhage, of eclampsia, and of phthisis. No doubt the unmarried females suffer much more from actual penury and want, along with intense mental depression and anxiety; but in this institution, as in all others where unmarried females are received, the great cause of the increased mortality is the want of ventilation and the overcrowding of the wards. On the other hand, we believe that the too free admission of cold air directly upon the patient is not without its dangers in the puerperal state."

In regard to the signs of pregnancy, the brown-coloured mesial line on the abdomen was observed in about one half of the cases. Dr. Faye does not think that the intensity of the sound of the fœtal heart in various parts of the abdomen during gestation affords any certain rule for judging of the position of the fœtus.

In 1850, the number of patients received into the hospital was only 134, as an epidemic of puerperal fever had broken out there, and caused it to be shunned by those who otherwise would have sought its aid. In the first fatal case, peritonitis came on shortly after delivery, and the patient died on the fifth day. This female had been in the constant habit of using cold water injections during her pregnancy, to relieve obstruction of the bowels; and Dr. Faye suggests, though we cannot agree with him, that the custom may have had an unfavourable effect on the system. The second case proved fatal, with symptoms of puerperal mania, and our author speaks very favourably of the use of Dover's powder in cases of maniacal excitement at the period of delivery. He condemns altogether the old routine system of blood-letting and antiphlogistic treatment, which he considers to be more likely to keep up nervous excitement than to subdue it.

Premature labour was induced in one case, in a female who had been three times pregnant previously, but in each instance perforation had to be performed to save the mother's life. As she was exceedingly anxious to have a living child, premature labour about the end of the seventh month was brought on by the warm douche; but even at this early period the child could not be saved, and the mother sank, and died sixteen hours after delivery. Some pus was found in the uterine sinuses, which, as Dr. Faye thinks, could hardly have been formed in the few hours that elapsed between delivery and death. It is remarkable that this dwarf (for she was only forty-six inches high) had menstruated regularly from the first twelve months after her birth.

A fatal case of hydrorrhea after delivery occurred this year in the hospital. The female, aged forty, had suffered from general dropsy during her pregnancy, but the urine did not contain albumen. Every part of the body was œdematous at the time of her entry into the hospital. Shortly after delivery a copious discharge of slightly sanguineous serous fluid took place from the vagina; and though the uterus contracted well, she sank under repeated attacks of syncope, and died in nine hours. The whole body was found to be infiltrated with serum, but the kidneys were quite free from disease.

During this year much puerperal fever prevailed in the institution, in spite of the increased accommodation that had been provided; but it is possible that the new apartments were occupied too early. Not less than 55 cases of puerperal fever occurred among the 134 inmates, and of these 19 died. In all cases but two careful post mortem examinations were made. We would have extracted the results of these post mortem examinations, which are given at great length by our author, but we return to the subject when we examine his special essay on this malady. No exertions seem to have been spared to stay the progress of the disease; ample accommodation was found for those attacked, and, as a prophylactic, the sulphate of quinine in two-grain doses was given three times a day to all the other inmates. Subsequently, Dr. Faye increased this dose to six grains three times a day, and, he believes, with really good results, for the violence of the disorder began immediately to abate. He allows that this may have been merely a coincidence, but the same good results have been observed in France and elsewhere. He gave them eighteen grains per diem for two days, and then gradually diminished the quantity, till he ceased the administration altogether on the fifth day. At the commencement of the epidemic, Dr. Faye treated his cases much in the usual routine way, giving chiefly salines, with opium and ipecacuhan; but it soon appeared that the tendency to inflammatory action, such as had existed in the previous year, was no longer present; and that there was only a feeble reaction, with a great tendency to passive exudation and the formation of fibrinous deposits. On this account he made trial of the sulphate of quinine, at first in small doses, but afterwards in greatly increased quantities. The effect of the augmented doses was decidedly salutary; they seemed to give support to the constitution, to abate the rapidity of the symptoms, and to enable the system to pass through the stage of blood fermentation without the development of any great tendency to exudation. Under the administration of quinine, Dr. Faye thinks that we can bleed more freely, if requisite to do so, without fear of too rapid exhaustion of the vital powers.

In 1851 the number of patients was 150, while five remained from the previous year. In this year's report, Dr. Faye states that the forceps cases are on the average but few, and he has employed instruments of late years less than he did at first. The proportion of forceps cases to natural births is about 1 in 33, while perforation has never been resorted to during the last ten years, and only twice employed during the whole period of the existence of the institution. Puerperal fever was less frequent than in the preceding year, and there were comparatively fewer fatal cases. In many instances the affection of the peritoneum and uterine organs produced very little pain, which indeed was only complained of on firm pressure in the iliac regions. Dr. Faye did not often meet this year with the paralysis of the coats of the intestines which in 1850 resisted the most powerful purgatives, and he believes that the early employment of laxatives is of essential importance, as they are totally useless after the disease has progressed for a time. The mortality was about 1 in 30. In 1852 the inmates were 180, and the sanitary condition of the institution was decidedly better than in the two preceding years. The mortality was 1 in 30, including one case that proved fatal after the Cæsarean operation.

The last report by our author is for the years 1853 and 1854 conjointly, when 336 females were received into the hospital. Of these about 80 were more or less affected with puerperal fever. The mortality, however, of the whole inmates was only 1 in 56, and of this only two or three fell victims to puerperal fever. We have purposely avoided entering upon the elaborate dissertation given by Professor Faye in these four last reports upon the nature, diagnosis, and treatment of puerperal fever, as we wish to avail ourselves in this regard of his most recent publication on the subject, which appeared in the 'Norse Medical Journal' for 1858 and 1859. In this essay our author has embodied his latest experience and opinions, and the essay itself originated from a sharp discussion which arose in the Norwegian Medical Society upon the subject in question, and upon Professor Faye's innovations in the treatment of puerperal fever. The discussion, no doubt, was in part an echo of that prolonged and acrimonious dispute which recently took place in the French Academy of Medicine upon the same subject. Our author has been vigorously attacked by some of his medical brethren for the supposed inconsistencies between his theory and his practice; but he ably defends himself on the plea that his department is no more of a positive and fixed science than any other portion of the practice of medicine; that it is always progressive and liable to change, as further experience and research show the groundlessness of our theories or the errors of our practice. While he avers that it is impossible in the ever-varying phases of puerperal fever to lay down any general system of treatment, yet he maintains that the early administration of certain medicines, and great attention to the hygienic condition of the patient, may bring about excellent results. He commences his essay with a brief sketch of the history of the hospital and of his early connexion with it, giving in detail the changes he made from time to time both in his theories and his treatment. In 1847 he thought he had discovered in opium a safe and sure remedy for puerperal fever; but the epidemic of 1850 dissipated this illusion, and further experience showed him that opium could not be relied upon. At that time, as he acknowledges, he was almost in despair at his want of success; it seemed, as was said formerly on a similar occasion by an old Danish professor (Bang), that the physician stood at the bedside of the puerperal fever-stricken patient as the priest of death, and it was not till a somewhat later period that he found that calomel given early and in full doses, so as to produce free evacuation of the bowels, with the equally prompt and early administration of quinine, really did exercise a salutary influence on the progress of the malady. But, with the honesty of his country and with the true reserve of the eclectic physician, he acknowledges that this may only hold good for a time; other epidemic influences, other types of disease, may influence the form of puerperal fever, and success may no longer crown the plan of treatment.

While he fully admits that puerperal fever, especially when it occurs as an epidemic, is a most intractable and dangerous disease, he maintains that if taken early and treated actively, it may often be arrested.

> "When I undertook the charge of the Maternity Hospital in Christiania, I heard on all sides that puerperal fever was peculiarly dangerous in this locality. A gentleman holding high office in the State assured me that puerperal females in the hospital were regarded as 'damnatæ.' I thought of old Bang's prescription: 'Give mistura acida, and send for the chaplain.' I had often read of this disease as the 'opprobrium medicorum.' I was acquainted with Professor Cruveilhier's saying, at a time when an epidemic of this malady raged in the Maternity Hospital at Paris, that 'he would rather be a hewer of wood than a physician under such depressing circumstances,' and I had seen that, both in Vienna and in Paris, all regular treatment had been given up. Moreover, English authors of late years had characterized this complaint as 'the plague of lying-in hospitals, and the horror of private families,' and on the occasion of my last visit to Copenhagen I heard from one of the senior physicians that all treatment there was regarded as unavailing." (p. 14.)

Dr. Faye's plan is to give one or two large doses of calomel (after Ritgen's method), and then to rely chiefly upon the energetic employment of quinine and opium, with cold water compresses (Neptunus belte) externally. In the primary forms of the malady he considers other treatment unnecessary and hurtful.

In the secondary forms he gives tincture of iodine, three drops thrice a day with the food, and he rarely goes beyond this dose. In very severe cases he has recourse to stimulants—ether, camphor, &c.

With regard to quinine, twenty to thirty grains is the highest quantity administered in one day, but in one single case he gave forty-eight grains in twenty-four hours. He believes that when opium is given along with the quinine, the effects of the latter upon the nervous system—giddiness, deafness, and the rest—are very much diminished.

Although Dr. Faye has chiefly confined his treatment of puerperal fever to the administration of quinine and opium, with previous free purging by calomel, he has yet tried most of the vaunted new remedies in this disease. Thus he has lately given the veratrum viride in a few cases, as recommended by Dr. Barker of New York, but without any satisfactory results. While he allows to digitalis the power of very materially modifying the circulation, he affirms that in real cases of fever it has little or no influence over the heart's action.

Above all, he considers it to be of paramount importance that the treatment should be commenced early. It is indeed often difficult to distinguish the premonitory signs of puerperal fever from the usual milk fever, or from the deep-seated pains occasionally felt after delivery in the lower part of the abdomen, and which are not followed by any serious consequences. Our author seems generally to act on the safe side, and to begin with vigorous treatment whenever the symptoms are of doubtful character. Dr. Faye considers the condition of the puerperal female to be quite different from that of any other individual. Nowhere do you meet with this peculiar condition of the blood where fibrine is in such excess and the red particles and albumen so scanty, while the watery constituents and white corpuscles are in excess; and this condition, with the peculiar nervous diathesis, tends in a high degree to dispose the patient to various influences, and to hurry her into a febrile condition or blood fermentation of peculiar character. He acknowledges that the same causes which produce puerperal fever will in other individuals have equally bad effects, but the disease thus produced will be of a different character, for the constitution of the individual attacked is in a different state from that of the puerperal female. If, for example, we compare puerperal infection with that condition that prevails too frequently after great surgical operations, we find the causes to be the same indeed—viz., the influence of certain poisons, gaseous and otherwise, upon the mouths of open vessels; but still the individual character of puerperal fever will be wanting.

Much of what follows in Dr. Faye's last pamphlet is of a controversial character, and is in answer to the objections raised to his theories and treatment by some of his colleagues. We do not think ourselves called upon to enter upon these more personal matters; our object has been to lay before the profession the opinions and experience of one who has devoted many years to the study of this branch of our science, and whose highly cultivated mind has been well fitted for observing the progress of this still obscure disorder.

REVIEW IV.

Conférences de Clinique Chirurgicale faites à l'Hôtel Dieu pendant l'année 1858–1859. Par M. A. C. ROBERT, &c. &c. Recueillies et publiées sous sa direction par le Dr. DOUMIC.—*Paris*, 1860. pp. 535.

Surgical Clinical Lectures delivered at the Hôtel Dieu during the Year 1858–1859. By M. A. C. ROBERT. Collected and published under his direction by Dr. DOUMIC.

WE have read this work with more pleasure than we can easily express. It is interesting enough in its subjects—ranging as they do over nearly the whole of surgery—and perhaps even more interesting from the view which it opens to us of the style of practice of modern French surgeons, and the extent to which they are indebted to their colleagues and fellow-labourers in other countries. In this latter respect M. Robert has set an example worthy of all honour and imitation. Justly confident in his own great reputation and long experience, he does not hesitate to confess that in some matters he is still only a learner, and is quite content to adopt the ideas and even to explain to his scholars the practice of other men, when that practice seems to him better than his own. It is rare to see so much erudition combined with such graceful modesty.

The plan of the book is very much like that of Dupuytren's 'Leçons Orales;' but it has some advantages of form over that great work, inasmuch as M. Robert's lectures, although drawn up by one of his scholars, are reported generally as they came from his own mouth, in the first person, instead of the cumbrous third person adopted by the reporters of the 'Leçons Orales,' which constantly leaves us in doubt whether we are reading the words which Dupuytren used, or merely receiving the impression which they left on his hearers. M. Robert's book is, however, far slighter than the magnificent record which the genius of Dupuytren has left of itself in the 'Leçons Orales.' The topics treated of in this small volume of 535 pages are forty in number. The greater part of them consist merely of a single case, described in lucid and concise terms, with a few brief observations upon it. The articles are, for the most part, merely what they profess to be—viz., consultations—and therefore, of course, their main object is diagnosis. No pains are spared to expound successively all the symptoms and their bearing upon the diagnosis, to weigh all the hypotheses to which they might give rise, and to elaborate the final conclusion to the utmost extent of ingenuity. Very possibly this logical precision of diagnosis is carried further in the French than in the English schools—perhaps we may be right in our general impression that French practitioners affect to push the refinement of their diagnosis beyond what is really practicable—but the fault, if it be one, is venial, and an imitation of this rigorous argumentative method in our own schools would take away from English surgery a reproach which we have heard from intelligent foreigners—viz., that while practice is in a very advanced condition with us, and while the patient probably gets on far better in an English than a French hospital, oral teaching is not nearly so perfect, and the student derives much less instruction from his professors here than he would do there. The reason of this, doubtless, is in the greater attention paid in France to logical forms. Read a series of English clinical lectures, and compare them with such a book as the present—in the former the topics seem to come to the mind of the author in any order, and the result is frequently many useful suggestions, much valuable information, and a very readable treatise, but little scientific precision. In the French style everything is precise, cast in the same mould, arranged in the same order—the same forms of sentence even are constantly recurring. Hence a somewhat monotonous effect on the whole; but every part is clear and impressive. In fine, Frenchmen have a passion for exactness in science which our English authors have rather injudiciously neglected.

But to return to the more immediate subject of this review. It would be impossible to follow M. Robert through all the topics which he treats, so we must content ourselves with giving the reader merely a sample of what they may find in this work, premising however that every part of it is replete with interest, and will well repay an attentive perusal.

M. Robert, in his preface, directs the reader's special attention to the following, amongst the many subjects which he has treated: Anæsthesia, fractures of the fibula, some symptoms caused by the development of the wisdom teeth, the cure of vesicovaginal fistula, fibrous tumours of the nasal fossæ and pharynx, painful affections of the joints, especially hysterical pain in the hip, and spontaneous fractures. We cannot do better than expound our author's views on these, the salient points, of his book, and if in anything we shall take the liberty of disputing any of M. Robert's opinions, we need not say that it is done with the utmost diffidence and a proper sense of the danger of questioning the authority of so eminent a surgeon.

The subject of anæsthetics occupies the longest article in the book; but it is not one to which the attention of the English reader will be most directed, since it contains little or nothing which will be at all new to one acquainted with the work of Dr. Snow. In fact, M. Robert acknowledges, with the greatest candour, his obligation to that zealous inquirer, as well as to other English writers, for the greater part of his facts, and adopts unreservedly Dr. Snow's principal conclusions, both theoretical and practical, arguing in exactly the same way as he did against the dangerous practice of giving chloroform without some instrument for regulating its dilution, and refusing, as energetically as he did, to allow that the bad effects hitherto observed to follow from its use form any reason for discontinuing it, even supposing that such a course were practicable. He concurs also with Dr. Snow and Mr. Bickersteth in not regarding organic disease of the heart as an absolute contra-indication to the use of anæsthetics (although, as he very justly says, great caution must be used); and he appears to speak of its employment in midwifery as quite legitimate. (pp. 44–46.)

Two singular exceptions M. Robert makes to the application of chloroform in surgery—viz., in operations for hernia and ligature of arteries, in each of which he dissuades the employment of the anæsthetic, on account in the former of its depressing effect, which in his opinion assists the tendency to syncope already existing in that complaint; and in ligature of arteries for the following reasons:

> "The first condition, for the performance with safety of a long and delicate operation, is that the surgeon should have his mind quite free. Now, however intelligent the assistants who manage the inhalation may be, still the administration of chloroform is a great preoccupation for the surgeon. Suppose, indeed, that in an operation of this kind the patient were to awake, he no longer is aware of what is going on, and may execute disorderly movements which put his life in danger. I confess that, for my part, I would rather in such a case not perform the operation than do it with the constant fear of seeing some accident occur. So that you must reason with the patient and persuade him to allow the operation to be done without chloroform, and exaggerate to him the dangers of anæsthesia; besides, when the integuments have been once divided, the minute researches undertaken in order to expose the artery are not very painful, and at least the surgeon is able to give to these dissections all the attention of which he is capable.
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> "But these are not the only motives which lead me to reject chloroform in these operations. The arteries, you know, are almost always accompanied by important nerves; now, I need not recal to you the grave inconvenience which would follow from including the nerve in the ligature with the artery, or even tying it instead of the artery; the pulsation of the artery is not always perceived; anatomy, no doubt, tells us what the relations of the vessels are, but this is not enough; the only means of clearing away all doubt is to interrogate the sensibility of the tissues. Pinch the exposed cord tightly—if it is a nerve the patient will complain of pain in the whole course of the nerve; thus you find your error, and you search about for the artery which you wish to tie. It is necessary, then, that in these operations the patient should not be narco-

tised, since the pain which you excite enables you to distinguish the arteries from their accompanying nerves."

We quote these opinions of M. Robert without sharing them. Conscious as we are of the respect due to all dicta on practical subjects of so practised an operator, we cannot refrain from observing that we have seen a vast number of operations for hernia done under chloroform without any kind of bad result; and that in the very few in which much depression followed the operation it has seemed to us to be due to prolonged strangulation and previous exhaustion, and not to the chloroform, and we are by no means sure that the shock of the operation, trivial though it be, would not have proved as detrimental. Still to persons much depressed, and partly insensible from exhaustion, the operation is often quite a matter of indifference, and probably many persons would prefer in such cases operating without chloroform.

We are more surprised that M. Robert should refuse chloroform in cases of ligature of large arteries. These vessels have been tied over and over again under the influence of chloroform, and no difficulty has been experienced in distinguishing them from the accompanying nerves. We have seen the operator, in ligature of the femoral, expose and avoid the nerve without the least difficulty—and the same may be said of the subclavian—and we even venture to think that the more leisurely dissection, which is possible only when chloroform has been given, is a far better guide than the sensations of the patient, who may be by that time (for it must be remembered that operations on large arteries sometimes last an hour or more) so worn out by fear and pain, as to be able to give no satisfactory indication.

Again, it would surely be much more easy to keep a patient quiet who is rendered insensible by chloroform, than one in whom any sudden pain may cause a fresh movement. Besides, we may remark that the information furnished by the patient has not prevented these accidents from occurring before chloroform was invented. On the whole, we think M. Robert has been betrayed into a rhetorical exaggeration in saying that he would prefer not tying an artery at all to using narcotics in the operation.

With reference to local anæsthesia, M. Robert speaks discouragingly. He seems, curiously enough, to pass over its application in the very cases in which we had always regarded it as peculiarly appropriate—viz., in the removal of subcutaneous tumours—and says that it can only be applied in operations on the fingers, toes, and penis, since there only, as he says, can the whole member be safely frozen. We confess to frequent failures in attempts to freeze whole fingers, when inflamed (as they generally are when operations are required), although we have sedulously followed the instructions of Dr. Arnott, which have been quite successful in other instances, while we have often been gratified at the immunity from pain obtained by this plan in removing such tumours as the fatty, sebaceous, &c., which lie directly under the skin, and do not require any long dissection. It is true that these operations are not very painful (as surgeons reckon pain), but they inspire considerable dread in patients, and it is convenient to have a method perfectly safe and free from any pain or inconvenience, and which will abolish even the fear of the operation.

In reading this article, English surgeons will find just cause for satisfaction at the complete adhesion which their views on anæsthesia have obtained from our eminent contemporary.

The next article relates to fractures of the fibula. In this essay, which is rather more elaborated than most of the others, and forms an interesting companion to Dupuytren's treatise on the same subject in the 'Leçons Orales,' M. Robert gives a very useful *résumé* of the doctrines and precepts of most of the leading authors who have endeavoured to advance surgical theory and practice on this head. In treating of the agents of displacement, he comes to the conclusion that the gastrocnemius is almost the only considerable muscle whose action requires to be antagonized, the peroneals and tibials having, as he says, too slight a leverage to be at all formidable. To this statement many of his readers will probably demur, as somewhat too general. He has assured himself, he says, of the inaction of the peronei, not only by theory, but also by "l'observation d'un certain nombre de faits;" but it may be permitted to us still to believe, with Quain* and others, that the peroneus longus does in some cases exercise a considerable power in everting the sole of the foot, and that consequently, in rare instances perhaps, some mechanical means may be required to neutralize this tendency. After all that has been said and written on these fractures, M. Robert admits (agreeing in this respect with his great predecessor, Dupuytren) that the essential principle of successful treatment remains what Pott long ago pointed out—viz., to relax the great muscles of the calf by flexing the leg on its outer side. Accordingly, the chief object of this article is to enforce the "position de Pott." Of M. Maissonneuve's theoretical division of fractures of the fibula, according to the supposed action of their causes, into fractures by adduction, by abduction, and by divulsion, our author speaks in decisive condemnation (p. 101). "I say that this division is completely speculative, that it is supported by no facts, and is even contrary to observation, and that consequently it cannot be maintained."

The chief interest of this article is perhaps in its account of the ancient methods of treatment, and their painful and discreditable results, and of the contrast furnished by the effects of a return to a more common sense and less meddlesome practice. In surgery, as in every other department of science, the greater part of the advance which has been obtained up to our time has consisted in clearing away unsound theories and artificial methods, invented before men had sufficiently appreciated the truth which stands at the head of our great philosopher's greatest work, that their office is "to minister to and interpret nature," not to dictate to and improve her.

Of the article "On some Symptoms caused by the Development of Wisdom-teeth," we must speak very briefly, although it is of great interest, both from the clearness with which M. Robert has given his statements, and from the almost entire omission of the topic in our ordinary surgical works. The affection of which M. Robert is here speaking consists in a tardy or obstructed growth of the last tooth, which sometimes in consequence assumes an unnatural direction, growing in the direction where it meets with the least resistance, and thus pressing on the coronoid process, on the tongue, &c., and exciting at first constant pain, and afterwards inflammation of various kinds. The treatment consists at first in getting the mouth open, so as to have a satisfactory inspection of the parts—a thing often of the greatest difficulty, and which M. Robert manages by inserting between the teeth wedges of wood or ivory, increasing daily in size;* next, in incising the soft parts freely over the offending tooth, which is sometimes sufficient for the cure, if the direction of the tooth is natural; if not, the extraction of the tooth will cure the disease, unless necrosis has been set up in the adjacent bone—a frequent complication, which of course can only subside on the removal of the sequestra. Of this ailment M. Robert has given nine cases, most of them his own, but some borrowed from a paper by M. Toirac, the only treatise on the subject with which M. Robert is acquainted. These nine cases were accompanied by the following symptoms:

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* Anatomy, vol. i. p. 402, edition 1848.

1. Obstinate closure of the jaws; large abscesses; necrosis of the coronoid process.
2. Extensive ulceration of the cheek.
3. Ulceration of the tongue, looking like, and mistaken for syphilis.
4. Closure of the mouth; repeated abscesses.
5. Fistulous abscess in the region of the chin.
6. Abscess in the cheek.
7. Chronic abscess in the tonsil. A very interesting case reported by a medical man, who was himself the patient.
8. Large abscesses in the face and neck; fistulæ burrowing under the skin; hectic fever.
9. Large abscess in the neck, causing exhaustion and death.

This last case ought not, we think, to have been placed in the series, as the origin of the abscess appears to have been in caries of the alveolar process, and the mere fact that the situation of the caries was in the alveolus of the wisdom-tooth, gives no peculiarity to the case. In all the others the treatment was successful.

We now turn to the article on vesico-vaginal fistula, in which M. Robert explains minutely to his class the superiority of the American method proposed by Dr. Hayward of Boston, Dr. Marion Sims, and Dr. Bozeman, over all previous methods of treating this fearful malady, which up to the commencement of the labours of the Americans, had resisted the persevering efforts of the most celebrated plastic surgeons, while since the final improvements of Dr. Bozeman, the operation has been brought to so high a state of efficiency, that Mr. Baker Brown alone has been able to announce a greater number of cures than had ever been obtained by all previous surgeons since the commencement of our art. In order to test the value of the American method, M. Robert, with the liberality and courtesy which ought to distinguish every one who follows science for her own sake, invited Dr. Bozeman to operate on a very formidable and complicated case then in the wards of the Hôtel Dieu, which had been twice operated on before with no success whatever—once by M. Vernueil, and once by M. Robert himself. Dr. Bozeman at first hesitated, as he well might, for the opening had a diameter of 3½ centimètres (more than 1¼ inch), and comprised so much of the fundus of the bladder, that the right ureter opened on to the edge of the wound. Hence he appears to have feared that a failure, which the formidable nature of the case rendered only too probable, might compromise his method, and lead to a suspicion of its inefficiency in France. The operation, however, was performed in the presence of M. Robert and his class, and with such success, that the patient was restored to the complete enjoyment of health. The only deduction that is to be made from the absolute perfection of the cure is that there remained an opening, imperceptible to the eye, and not even discovered by injecting milk into the bladder, through which a small drop of clear water might be seen occasionally to fall into the vagina. The probability seems to be, judging from the description, that a fistulous opening was left communicating with the right ureter (which, as before mentioned, was seen in the wound), and not with the bladder. This decisive success has completely convinced M. Robert of the superiority of the American method, and with a modesty worthy of all praise and imitation, he does not hesitate to assume the position of a scholar, and to describe and explain to his class in what the operation consists, what are its points of superiority over the methods previously in use in France, why it succeeds, and why they fail. Surgery would perhaps advance more quickly than it does, if its professors showed the same absence of prejudice, the same desire to avail themselves of the inventions of others, and the same candour in ascribing to the inventors their due share of honour, which M. Robert has here displayed. In this particular instance, indeed, we in London gave an equally cordial reception to Dr. Bozeman as he obtained in France, inasmuch as he was invited to operate on a patient of Mr. Erichsen at University College Hospital, and although that particular operation failed, no prejudice was allowed to rest upon the treatment from one accidental bad success. One slight error we would notice in M. Robert's essay, which proceeds from the inveterate ignorance of English customs which seems incurable in France. He says:

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* M. Robert notices the great effect which cold and damp weather has upon this closure of the mouth. He says, that even in a case where the separation of the jaws has been carried to the extent of an inch or more, a wet cold day, with a little exposure on the part of the patient, will suffice to undo all the good that has been done. Hence, the patient must be kept in a room with an equable warm temperature while the treatment is in progress.

> "I must premise that vesico-vaginal fistulæ, very rare in France, are, on the contrary, frequent in England and America, on account of the position which women are made to assume during their accouchement in those two countries. They make them sit in a chair; thus the pelvis is in a depending position, and the fœtal head presses strongly against the walls of the vagina, so that fistulæ are common." (p. 148.)

This is a ludicrous error, as M. Robert can easily see by consulting our books on midwifery, although we think we remember to have heard that such a practice does prevail among some less civilized section of the community; but it is also of some consequence, as tending to distract the reader's attention from the true cause of these fistulæ, which is almost always to be found, not in the position of the woman during delivery, but in the labour having been injudiciously allowed to last too long, and in the consequent sloughing of the parts from long-continued pressure. It is true that in M. Robert's case the labour had not lasted very long; but then the presentation was unnatural. There may also be other cases in which, from some unknown cause, the parts are more than usually susceptible to injury, and where the lesion is inevitable; but few people who have seen many of these cases will doubt that in the great majority it might have been obviated by timely interference.

The French surgeons have made the surgical treatment of 'Naso-pharyngeal polypi' so peculiarly their own, that operations for this disease have been much more common in France than England; and among the operators none have had a larger experience than M. Robert. He is able to trace down the whole history of surgical practice on this head, from the time when he saw Dupuytren endeavour the cure of these formidable tumours by evulsion or ligature, to the bold proposition of M. Flaubert of Lyons—the excision of the upper jaw in order to reach the tumour; the final recognition of this operation as the proper treatment in a certain class of such tumours, and the scientific separation from these of another class in which the indications are different. Thus the diagnosis and treatment of these cases, which was quite in its infancy when M. Robert commenced his studies, has been brought during his lifetime, and in a great measure by his exertions, very nearly to a state of perfection. The subject has been so little studied in England that we have found it to be novel even to surgeons of considerable experience, and M. Robert's article on it is so excellent that perhaps an abstract of it may induce some of our readers to seek more ample details in the original.

The title of the essay is "On Fibrous Tumours of the Nasal Fossæ and Pharynx." These M. Robert divides into three classes:

1. Fibrous "masses" (*corps fibreux*), as he calls them, or as they might perhaps be termed, for the sake of distinction, "interstitial fibrous tumours," which are connected almost exclusively with the antrum, but are found in rare cases in other cavities, as the ethmoidal and sphenoidal sinuses. In the diagnosis of this form, M. Robert points out, as facts of great importance, that they expand the bone which covers them, so that it frequently conveys to the hand that peculiar crepitating sensation first pointed out by Dupuytren, and regarded by him as peculiar to bony cysts, and also that they are only found in children and young persons, almost always males, while osteo-sarcoma (by which term he means malignant tumour of the bones) is, according to him, common in old persons. The latter diagnostic sign applies to all forms of fibrous tumour. M. Robert says that he

has never seen the interstitial form of tumour (*corps fibreux*) in a female, and the fibrous polypus only once. Another diagnostic sign is the state of the teeth. In malignant disease they are soon loosened and fall out; in innocent tumours, on the contrary, they long remain fixed in their alveoli. The latter diagnostic signs also apply equally to all forms of innocent fibroid growth, although M. Robert does not make this very plain. In the conclusion of his notice on these *corps fibreux*, he allows (what every one who has studied the subject must have noticed) the difficulty at a late period of distinguishing this form of fibrous tumour from a polypus. The growth, which was at first sessile, has protruded into some cavity, such as the pharynx, and then only the superficial or pedunculated portion of it is seen, which very closely simulates a polypus.

2. The next of M. Robert's three classes is that of fibrous polypus of the nose—easy to diagnose and to treat when they spring from the anterior part of the nasal cavity, more difficult when they spring from high up in the nostril, near to or in the pharynx. However, we may always, according to M. Robert, endeavour to ligature such growths, since the attempt, even if unsuccessful, can do no harm. It should not be forgotten, however, that tumours springing from the base of the skull may simulate common fibrous polypus by projecting into the nose. Such a case, occurring in the practice of M. Huguier, is related here. The patient was a child, aged ten. The root of the nose was dilated by the pressure of a tumour. M. Huguier divided this part, removed the nasal bones, and endeavoured to reach the root of the disease. He was, however, unsuccessful, and the child died of meningitis.

3. The last kind of tumour, and the most dangerous, is that which is more especially the subject of M. Robert's essay. These are usually developed in the basilar process, or on the internal surface of the great wing of the sphenoid, and hence are more naturally in relation with the pharynx; but they have a great tendency to pass into the nose, and therefore are called naso-pharyngeal polypi, of which M. Huguier's case seems to have been an example. Such tumours sometimes grow from the vertebral column, a fact denied by M. Nélaton, but asserted by M. Robert on the strength of a case which seems to leave no doubt upon the matter in his mind, and for which he appeals to his class: but the notes are not appended to the paper. Another place of origin of these tumours, to which M. Robert believes that he has first called the attention of surgeons, is the petro-occipital suture. We in England will be quite satisfied to put aside these anatomical niceties, and to think of such tumours as originating in the base of the skull, or perhaps rarely in the upper part of the spinal column, and projecting into the pharynx or nose. They may even grow down upon the larynx, and give rise to symptoms of suffocation, or they may separate the muscles of the pharynx and pass into the zygomatic fossa, or on to the cheek, &c.

The extent of attachment of these polypi varies. In some cases they are sessile, and then it is hard to see how they differ from the tumours described by M. Robert as "corps fibreux." But a more serious complication is that they sometimes contract adhesions to the neighbouring parts, which, when those parts form a portion of a mucous surface, are often the result of ulcers, and oppose an insurmountable obstacle to the enucleation of the tumour. When, on the other hand, the tumour grows towards cellular tissue (as under the cheek), the adhesions are cellular, and easily broken down. The prognosis of these tumours is less grave, according to M. Robert, than M. Nélaton has asserted. The latter maintains that "patients with these tumours never live to be old." M. Robert, on the contrary, refers to "two or three" patients on whom he has operated, and who are living in perfect health, more than ten years afterwards;[*] and sometimes, though rarely, these tumours are cured by a spontaneous process of sloughing. Of this we have ourselves seen one instance.

Having thus gone through the description and diagnosis of these diseases, and having encouraged his hearers by his own experience to hope for success in their treatment, M. Robert next proceeds to show what that treatment ought to be in each case.

I. For the first form, the interstitial tumours, or "corps fibreux," originating, as they generally do, in the antrum, it will usually be necessary to extirpate the upper jaw.[†] As to this operation itself, he says that he has performed it twelve or thirteen times, and has never lost a patient. Sometimes, however, a less radical method will fulfil the indications, and the floor of the orbit, or the hard palate, may be saved.

II. For the nasal polypi, M. Robert does not lay down any precise rules. He speaks rather unfavourably of the ligature in this form of polypus, but we will not follow him into the discussion, which indeed is not carried out very fully in the essay before us.

III. We now come to the chief subject of M. Robert's paper—the treatment of naso-pharyngeal polypi. The base of the tumour being removed from sight and touch, the first thing to be done is to perform a preliminary operation to admit instruments (as the knife, the ligature, the cautery) to act on it. The operation first proposed with this end is due to Manne, a distinguished surgeon of the last century, who proposed a vertical section of the soft palate. This would generally suffice, were it enough to pull away the polypus piecemeal. But, in order to cure the disease, it is necessary to follow it up to its insertion into the cranium, and to scrape or cauterize the base of the skull. This cannot be done without a larger opening than the simple division of the soft palate will afford. In order, then, to secure such an opening as will admit of free action on the pedicle of the tumour, two operations have been proposed, and each is applicable to its appropriate cases. The first—that of M. Nélaton—is an extension of the above. After the soft palate has been divided, the mucous membrane is raised from the hard palate, and a sufficient quantity of the latter removed with cutting forceps to admit the surgeon's eye, finger and instruments to the implantation of the tumour. The second is the excision of the upper jaw, first proposed and practised in a case of this kind by M. Flaubert, of Lyons, in 1840. As this proposal drew down on its author considerable obloquy at the time, it is but just that he should have the credit of his bold proposal now, when it is admitted as the orthodox practice of surgery. As in the case of the tumours of the first class, this excision may be, in appropriate cases, total or partial. The indications for each operation are as follows:—1. If a polypus be growing from the back of the nasal fossæ, on the vomer, or internal surface of the pterygoid process, and send a prolongation into the pharynx, or if it be growing from the middle of the base of the skull, or from the spinal column; when by passing a female catheter, or an elastic gum catheter, the position of its pedicle can be clearly defined, and the latter can be reached in its whole circumference from the pharynx, M. Nélaton's operation is applicable. 2. When, on the contrary, the tumour springs from the petrous bone, the petro-occipital suture, or the margins of the "foramina lacera," it will be only partially accessible from the pharynx, and resection of the upper jaw is indicated. This resection need not always be total, but no precise rules can be laid down on this head. M. Robert refers his readers to a thesis by M. Gosselin, 'On the Surgical Treatment of Polypi of the Nasal Fossæ and Pharynx,' and to a discussion at the Société de Chirurgie.*

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[*] Notes of two cases are given in which the cure was known to have lasted thirteen and sixteen years respectively.

[†] We may notice that M. Robert says (p. 290), that Gensoul invented this operation, thus ignoring the prior claims of the late Mr. Lizars. See the question discussed in South's 'Chelius,' vol. ii. p. 996.

The choice between total and partial extirpation must rest generally on the volume of the tumour, on its apparent place of attachment, and on its ramifications. M. Robert does not believe that the total extirpation of the upper jaw is an operation more dangerous to life than that proposed by M. Nélaton, but as it removes a large portion of the face, and of course leaves more or less deformity, the latter is preferable when the case admits of it. In doubtful cases it will be proper to commence with a partial excision of the bone, leaving the hard palate, which must then be removed, if necessary, to make room to come upon the root of the tumour.

The pedicle having thus been exposed, and the tumour removed by cutting it through as near its bony origin as possible, what is to be done with the part of the pedicle which is left behind? May it be left to nature, or is it necessary to destroy the whole of it by cauterization? M. Nélaton believes that it is; accordingly, after his operations, he breaks down the wound in the soft palate (which otherwise tends to heal rapidly) in order to apply caustics of various kinds to the pedicle. This treatment, according to our author, is very protracted, lasting on an average from two to two and a half months. It is also, according to him, very fatal, two out of six cases so treated having died; and it has the further disadvantage (we are still quoting M. Robert's opinions) of being quite useless. In the majority of cases the tumour shows no tendency to return; and if it has this tendency, the caustics frequently fail to stop it. Accordingly, M. Robert has renounced the employment of the actual or potential cautery to the stump of the tumour, and is satisfied with shaving it off as near the bone as he can. The small stump which is left in most cases withers away or remains stationary. Sometimes it grows to a certain extent, and then stops, still calling for no treatment. Sometimes, however, it will reproduce the disease, and then, while the tumour is still small, the cicatrix must be opened out in order to apply caustics to its base.

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* Bulletin, tom. i. p. 169.

Such are M. Robert's views with respect to these cases. It will be seen that he is in favour of the resection of the upper jaw, in preference to that of the arch of the palate; and in order to support his opinions he gives a series of 12 cases, of which only 4 were under his own care, the rest being borrowed from M. Michaux, M. Vallet, M. Nélaton, and others, and which have been treated in various ways—by evulsion, bit by bit, of the tumour, by excision of the palatine arch, by partial resection of the front of the superior maxilla, and finally, by total extirpation of that bone. The cases treated by the more radical operation seem certainly to have had the quickest and soundest recoveries. In England, as far as we are aware, resection of the upper jaw has been performed once only for this disease,* and the case succeeded perfectly. The tumour grew from the base of the skull, and had been the source of copious hæmorrhage.

We must apologize to our readers for the very imperfect sketch, which is all that our space will allow us to give of this important essay.

In following M. Robert's list of articles which he thinks worthy of special notice, we come next to one on "hysterical affection of the hip," which is written for the purpose of calling the attention of his pupils more forcibly to the doctrines of Brodie on this subject, and to illustrate them by a case in which the mistake was committed of confounding a hysterical affection with acute inflammation of the joint. The topic has, according to M. Robert, been much neglected in the French works on surgery. This article, therefore, which will convey no novel information to any reader of Brodie's work, need not detain us.

In the article on Spontaneous Fractures also there is not much that is novel. It consists of two parts—one in the form of a clinical lecture on a case of malignant disease of the femur and clavicle, leading to spontaneous fracture of the former bone, followed at the end of three months by no consolidation, but on the contrary by the absorption of a large quantity of bone; the second part is a comment on three cases of so-called spontaneous fracture (which ought, however, rather to be called fracture from muscular action), in which consolidation did occur.

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* At St. George's Hospital, by Mr. Tatum. The upper jaw was also removed at the same hospital by Mr. Prescott Hewett, on account of a tumour which proved after death (for the patient died under the operation) to be connected with the base of the skull; but the case hardly bears on the question of English practice in this disease, since the operation was undertaken in the belief that the antrum was the source of the disease. (See Medico-Chirurgical Transactions, vol. xxxiv.)

From the contrast of these two classes of cases, M. Robert concludes that fracture from the presence of a cancerous or hydatid tumour is in its nature incurable, while in those cases where the fracture is produced merely by muscular action union may generally be expected. The predisposing cause of the fracture is, according to M. Robert, generally indiscoverable, although a few cases may be traced to constitutional syphilis. Of spontaneous fracture from necrosis, M. Robert gives no instances.

Such are the topics which M. Robert thinks of most importance among the subjects of his lectures; but there are many others of great interest, which want of space must be our excuse for not noticing in detail. We may enumerate amongst these a very interesting essay on syphilitic tumour of muscles, and its cure by iodide of potassium; a proposal for a method of castration (not original, but which has fallen into desuetude) by dividing the rest of the cord, but sparing the vas deferens until the vessels have been tied, so that the cord cannot retract; an interesting parallel of the indications for excision and amputation in disease of the elbow; an article on amputation of the foot below the astragalus; and one on the diphtheritic affection of wounds, which M. Robert believes to be peculiar to hospital practice, and to be in fact a form of "hospital gangrene." We must now take leave of this interesting work, for which we augur a warm reception among English surgeons; not the less so because it shows the great influence which their writings have had on Continental theory and practice.

REVIEW V.

Relatorio da Epidemia de Febre Amarella em Lisboa no anno de 1857. Feito pelo Conselho Extraordinario de Saude Publica do Reino.—*Lisboa,* 1859.

Report of the Epidemic Yellow Fever at Lisbon in 1857. Published by the Extraordinary Council of Public Health. Folio, pp. 251.

IN addition to the valuable accounts drawn up by Dr. Lyons respecting the yellow fever that prevailed at Lisbon during the latter part of the year 1857, and which was succinctly noticed in the number of this journal for last January, there now lies before us the official Report made by the Portuguese Board of Health in reference to the same epidemic disease then brought under our readers' notice. Observing that this document contains various interesting facts not mentioned in our previous observations, it appears some general remarks thereon may not prove uninstructive or out of place on the present occasion; more especially as the statement in question has been drawn up with much attention, and is published under Government authority, having besides professional sanction in its favour.

According to the document whose title now heads this article, notwithstanding the prevalence of laryngeal affections, bronchitis, diseases of the lungs, and rheumatism during the first three months of 1857, which were followed in spring and the early part of summer by erysipelas, typhoid, intermittent and remittent fevers, as also gastric maladies, the public health of Lisbon proved satisfactory until the end of July, as shown by this conclusive fact, that the rate of mortality throughout the metropolis of Portugal actually ranged less than it had done during the analogous six months of the two previous years. Such was the sanitary condition of the Portuguese capital up to July 22, when the first well-marked case of yellow fever attacked a man dwelling in Padaria-street, whereof he died on the fifth day of his disease. A second example, affecting a woman, occurred on July 29, which likewise terminated fatally on the fifth day of her attack. Subsequently the epidemic spread to other districts, becoming more prevalent throughout August and September, but especially during October, about the middle of which month the malady manifested its greatest intensity.

In order to convey an accurate idea to readers of the prevailing disease appearing in its ordinary type and terminating fatally, the following outline of a case recorded in the Report will therefore prove instructive. The attack commenced with fever, quick and hard pulse, cephalalgia, pain at the epigastrium, dry cough, and tympanitic abdomen. This patient having been bled on the third day of his malady, the pulse now became weak and depressed. From the third to the fourth day, dimness of sight and impaired hearing supervened, deglutition then got embarrassed, respiration difficult, at the same time that some stertor was observed, with hemiplegia of the left side. These cerebral symptoms, however, disappeared about two days afterwards, being followed by increased cough and mucous expectoration, oppressed breathing, as also a sensation of heat in the anterior part of the chest. After continuing about three days, the above features, like those previously mentioned, here became much ameliorated, if they did not cease entirely, the skin also becoming generally yellow, with marked typhous symptoms. Intense and constant thirst was now present, the tongue got dry and dark-coloured, the teeth and gums being fuliginous, breath fœtid, respiration accelerated, while the urine deposited a brown sediment during the latter stages of the complaint. Finally, starting of the limbs, or tendinous spasms, made their appearance; hæmorrhagy from the mouth and arms likewise followed, gangrene on surfaces to which blisters or sinapisms had been applied, accompanied with somnolency and general prostration; when the sufferer died, manifesting a decidedly typhous condition.

The spreading of the disease from one locality to another deserves special mention. Thus, the Report says it travelled by slow and successive steps from place to place, generally from one street to another, and even from house to house, according to their proximity, and extending from lower to higher parts of the city; where, however, the epidemic manifested minor intensity than throughout less elevated districts. This progress seemed so regular, that observers could almost tell beforehand the course which the disease would pursue. Generally speaking, the epidemic spread from east to west; the central part of the capital, from being most populous, suffering in greater proportion than localities not so crowded, while the suburbs furnished much fewer cases, especially towards the western portion, in which only several isolated examples appeared. Towards the sea-shore, and in buildings abutting on the quays, which occupy a much lower position when contrasted with other parts of Lisbon, the complaint proved more virulent than elsewhere. In fact, and as might have been anticipated, the yellow fever appeared to obey the same laws with reference to its propagation which are commonly observed in other epidemic maladies.

Having become gradually more extended throughout August and September, the malady exhibited its maximum intensity towards the third week of October, on the 20th of which month 298 new cases were recorded, being the greatest number ever occurring in one day. From that date the disease got daily less frequent, and on the 31st only 185 fresh attacks came under notice among the entire population of Lisbon. On the 4th of November, however, 259 new cases were recorded, thus showing a temporary augmentation. But afterwards the number of cases diminished consecutively till the end of December, when yellow fever ceased entirely. During the period now mentioned—that is, while the epidemic lasted, the cases registered amounted to 13,757 altogether. Of these, 7842 were treated at the patient's own domicile, 5161 in special hospitals, and the remaining 754 in other establishments. Considering many instances may have been overlooked when yellow fever first made its appearance in the Portuguese metropolis, the Report now under review states that most likely the total persons attacked reached 18,000; which hence gives a ratio of one person affected by the epidemic in every eleven inhabitants. Respecting the mortality, it is added that 5652 cases proved fatal, of which 3466 died at the patient's own dwelling, 1932 in special hospitals, and the remaining 254 in other public institutions. Consequently, the proportion of deaths ranged about one in thirty-five of the total population; and if the number of attacks be assumed at 18,000, as the Council of Health believed, that would average one fatal case to every 3·18 individuals affected, which makes a high mortuary rate if compared with epidemic fevers prevailing in other European countries.

Some interesting statistical deductions may be derived from the tables contained in the present Report. For example, among the 3466 fatal cases which took place in private domiciles, 2061 were male and 1405 female patients, or 146 of the former to 100 of the latter, the period of life which seemed most fatal being from thirty to forty years of age; while married men seem to have died in a much larger proportion than married females. Whereas widows oftener fell victims to yellow fever than widowers, the proportion being about double in both categories; 12 married men having died to every 5 married women, and 10 widows to every 5·3 widowers. It is also curious, in reference to occupations, to know that more persons died who worked on wood than in metals; while those employed on leather also suffered considerably, as for instance, curriers and shoemakers. On the other hand, persons engaged in weaving silk and cotton, although they constitute a numerous body in Lisbon, only 24 deaths were reported against 108 among the former class of labourers—viz., on leather. Among professional men the mortality was greatly out of proportion to other classes. Thus 30 clergymen, 13 physicians, and 16 apothecaries died; besides 16 other medical practitioners who fell victims in the hospitals to yellow fever, or had retired to the country previous to their deaths. If comparisons be made betwixt persons belonging to the liberal or educated professions, and industrial labourers, the mortality proved much larger among the former than the latter, in reference to their relative numbers; 436 of the former category having died, or one-eighth of the entire amount recorded, which much exceeds the ratio of those engaged in handicrafts.

Besides the circumstances just mentioned as often influencing materially the termination of yellow fever, it was likewise observed that individuals, although strong and healthy, while enjoying many conveniences of life, frequently caught the disease if they remained in an infected district during several hours of the day-time, but more especially when residing and sleeping in an epidemic locality. This result oftener supervened where the dwellings were filthy, over-crowded, badly ventilated, and otherwise devoid of various ordinary hygienic appliances. Another important feature may likewise be mentioned—viz., the usually rapid course of the disease, particularly when it proved fatal; five days and a half being, in many cases, the period when that result followed, although in numbers death occurred much sooner. For example, among those patients who died in their own houses, 37 were only twenty-four hours sick, 115 had been ill two days, and 304 sunk under attacks of three days' duration. The number of deaths being not only more numerous throughout the month of October, but the fatal termination in such cases likewise taking place much sooner at that period, than during any other while the epidemic prevailed.

Subsequently the report gives a detailed account of the movement of patients attacked with yellow fever, who were received into the several hospitals when that malady existed in Lisbon. The total number treated in these institutions amounted to 5161; of whom 4043 were males and 1118 females—7 of the former to 2 of the latter sex; the recoveries being 3229, comprising 2499 males and 730 females; while 1932 died, or 1544 of the former sex to 388 of the latter. According to such data, it therefore appears the average mortality ranged as one death in every 2·67 admissions; or in five cases treated, about two died. The proportion of male patients received was at least three men to one woman; the fatal cases being however, comparatively, nearly analogous. In both sexes a very large proportion of the deaths recorded took place in persons varying from puberty to thirty years of age; 3003 fatal cases of the entire number previously stated having occurred among patients at that period of life; while only 31 instances were reported in children at or under their tenth year. The largest number of deaths occurred in bachelors; next the married, and lastly widowers; while among female patients, fewer single women became victims than in any other class of that sex. Another interesting fact should also be mentioned—namely, death was oftener the result in non-vaccinated patients than those who never had cow-pox; 1192 having been recorded among the former, whereas 2308 persons who were reported non-vaccinated died, or double the former number. This peculiarity, besides, shows how much vaccination seems to be neglected in Portugal; while it proves yellow fever also to have been less mortal among patients so protected than otherwise.

The movement of patients in the military hospitals who were attacked by the prevailing epidemic, next occupies the Board of Health's attention. According to their report, 626 men and officers were received into these establishments during October, November, and December, of whom 503 were cured and 123 died; thus showing a much smaller mortality than among the civil population. It is, however, worthy of remark that the disease proved more fatal to officers than to common soldiers. Thus, out of 8 officers admitted, 6 died, whereas among 501 rank and file, the deaths were 91, or two in every eleven admissions, which therefore makes a remarkable difference. It is also further interesting to mention that, among the 626 fatal cases recorded in military hospitals, only 34 were married men and 4 widowers—hence coinciding with the remark made in reference to civilians attacked by yellow fever—viz., that bachelors oftener died than married men—while 422 were persons from twenty to thirty years of age.

Again, as the garrison of Lisbon and Belem then amounted to 5230 men, and the total deaths being 626, about one-eighth of the entire number thus fell victims to the epidemic, whereby the proportionate mortality exceeded that noticed among the general population. The municipal guard also suffered considerably, since out of a force comprising 1161 men, 126 were attacked, of whom 39 died. The horse-patrols of this body were, however, less severely affected than the infantry; while patients treated at their own dwellings exhibited a smaller comparative mortality to those sent to the hospital. On board the ships of war at anchor in the Tagus, exactly 57 individuals were attacked, of whom only five died, which formed, therefore, a small mortality. In mercantile ships, the disease also made very little havoc—this immunity of the marine population being especially manifested among those guards who did duty on board of ships, and still more marked in a detachment comprising 120 men stationed at Belem, of whom not one became indisposed. The very reverse was specially noticed respecting persons employed in the arsenal, 291 cases of yellow fever having been registered in that establishment, of whom 106 proved fatal, the most of these having been constantly employed on shore, although a few occasionally worked on board of ships; which fact, as likewise others previously specified, conclusively indicated that it was much safer to live on the water than to occupy dwellings on the mainland.

Numerous tables accompany the report, but of which we have merely given a brief account of its salient features. The document certainly forms a valuable contribution to medical science, and will amply repay those readers who understand the sonorous language of Lusitania; since no translation into English has been, or is likely to be published. This circumstance, therefore, induced us, on the present occasion, to make a rather lengthened running commentary on those points which seemed most interesting, notwithstanding special notice was taken of the recent outbreak of yellow fever at Lisbon, when alluding in our number for January last to Dr. Lyons's important official document, illustrating the same malady, which was presented to Parliament, and printed by command of her Majesty. One instructive peculiarity should, however, be here remarked, and although corroborated by the present report, is nevertheless derived from another source than either of those above mentioned—namely, at many public institutions the disease was less extensively met with than elsewhere, such as the General Hospital, that of St. Lazarus, also the Orphan Establishment, the House of Mendicity, and in the Lunatic Asylum. Residents of prisons likewise suffered very little, while young persons under puberty rarely became affected, and generally recovered.

Before taking leave of the Report published by the Portuguese Board of Health, one or two general observations respecting the treatment pursued during the prevalence of the epidemic will neither be out of place nor uninteresting, even although it is distinctly stated by the medical authorities who drew up the document now cursorily discussed, that no remedy or curative means pursued merits any special mention on account of its utility, or the decided advantages thereby obtained. As preventives where persons are exposed to the invasion of yellow fever, considerable stress is laid upon avoiding bodily fatigue and moral emotions, exposure to the sun, indigestion, errors of diet, as also constipation; free ventilation and cleanliness of dwellings being likewise strongly recommended.

Besides such measures during the first stage of an attack, the usual remedies employed were mild antiphlogistics, diaphoretics, and aperients. Bleeding, either general or topical, was rarely employed; although some physicians did so on special occasions, where much fever existed, or local congestions supervened. Simple saline mixtures, lemonades, cream of tartar ptisanes, or those containing nitre, were generally employed with advantage. Dover's powder often proved useful when producing copious perspiration. Indeed, it was frequently remarked, whenever that effect followed either this or other diaphoretic remedies employed, a notable remission of the primary symptoms ensued, the malady then passing into its second or third stage. The aperients found most advantageous were sulphate of soda or of magnesia, seidlitz water, lemonade containing citrate of magnesia, and, lastly, castor oil. Occasionally calomel, alone or along with jalap, was prescribed; but the former remedy required to be used with great caution. Sinapisms to the nape of the neck, and tepid baths, appeared sometimes beneficial; while in the latter stages tonic treatment frequently became necessary, sulphate of quinine being chiefly employed, when it almost always acted salubriously. This tonic was administered both by the mouth and in clysters, besides endermically; sometimes in large doses, but, generally speaking, in moderate quantity, whereby the effects produced were more satisfactory. Wine was likewise often given, and proved highly salutary, especially as in numerous examples it was the only remedy which could be retained on the stomach; Oporto wine (port) being the kind which acted most beneficially. In short, tonics and an exciting mode of treatment were found best adapted to the late epidemic yellow fever, which devastated Lisbon in the autumn of 1857, especially during its advanced stages. Upon these important points the official Report, now brought under English readers' notice, speaks authoritatively; and we would therefore strongly recommend its perusal to British practitioners, were it not that we much fear, few of our countrymen can read the Portuguese dialect.

REVIEW VI.

1. *The Pathology and Treatment of Pulmonary Consumption.* By JOHN HUGHES BENNETT, M.D., F.R.S.E., Professor of the Institutes of Medicine and Senior Professor of Clinical Medicine in the University of Edinburgh. Second Edition.—*London,* 1859. pp. 221.
2. *On Consumption: its True Nature and Successful Treatment.* By GODWIN TIMMS, M.D. Lond., Member of the Royal College of Physicians of London.—*London,* 1860. pp. 412.
3. *Practical Observations on the Prevention of Consumption; with Statistical Tables.* By JOHN HOGG, M.D. Edin.—*London,* 1860. pp. 226.
4. *On Diseases of the Throat, Epiglottis, and Windpipe.* By GEORGE D. GIBB, M.D., M.A., Member of the Royal College of Physicians of London.—*London,* 1860. pp. 182.
5. *On Asthma; its Pathology and Treatment.* By HENRY HYDE SALTER, M.D., F.R.S., Fellow of the Royal College of Physicians, Assistant Physician to Charing Cross Hospital, &c. &c.—*London,* 1860. 8vo, pp. 372.

THE work of Dr. Bennett has arrived at a second edition. It is unnecessary to do more than refer to the chief novelties which are to be found in this work.

A chapter on diagnosis has been introduced with the view, as the author states, of rendering the malady—viz., pulmonary consumption—recognisable with greater certainty and precision. Some observations upon the importance of examining and treating disorders of the nasal passages have also been added.

Dr. Bennett expresses his belief that the general notion of the incurability of pulmonary consumption is mainly attributable to the fact that the disease is not recognised until it is far advanced. It is doubtless true that the early discovery and treatment of the disease would lead to the arrest of the malady in a very considerable proportion of cases; but, on the other hand, it is within the knowledge of every physician who has had to deal extensively with this disease, that notwithstanding very early diagnosis and the most judicious treatment, medical, hygienic, and regiminal, a large proportion of cases persist in progressing to a fatal issue.

The facility of diagnosis, according to Dr. Bennett, is as great as the curability of the disease. He says, "There is no disease which, in the great majority of cases, may be more readily detected by one practised in auscultation." He refers to harsh or tubular inspiration, to prolonged expiration, to increase of vocal resonance and dulness on percussion. Doubtless, when these signs are established, it will be easy to diagnosticate pulmonary consumption; but ere these signs are perceptible, tubercle may be present in the lungs to a considerable extent. We maintain that the diagnosis of pulmonary consumption, when the apex is already the seat of many small tubercles, is not always signalized by those signs; and that, if the physician would discover the malady at a very early period, he must do so with more delicate tests than those mentioned by Dr. Bennett, and such tests have not yet been made known. The author thinks, however, that medical science is not wanting. He blames the profession for its want of skill. "It is not that medical art is destitute of means of detection, but that the necessary skill is not sufficiently diffused amongst medical men." We are ready to acknowledge that there may be medical men who cannot detect harsh or tubular respiration and dulness on percussion; but we are assured that, at least in this quarter of the kingdom, such practitioners are extremely rare. It is not the skill of the modern practitioner that is wanting in the appreciation of the auscultatory signs mentioned by Dr. Bennett. We happen to know that most convincing evidence of the general diffusion of sound practical knowledge in auscultation amongst the members of our profession, even in country districts, is daily brought before the physicians of the Hospital for Consumption at Brompton. Patients are constantly presenting themselves there in the first stage of pulmonary consumption, who bear the marks of blisters, iodine pigment, and other counter-irritants, on the very spot under which young tubercle is invading the lung structure. Let it be borne in mind that these patients are in the lower ranks of life, and that many come from remote parts of the country, and it will be fully and freely conceded by every impartial mind that the reproach of Dr. Bennett is untenable, at least in this quarter of the country; and that, far from such a stigma being attachable to medical men, their skill is most creditable, in the first place to themselves, and in the second to their teachers.

One great cause of the non-diagnosis of pulmonary consumption in the first stage of the disease is to be found in the fact, that the distress suffered by the patient is so slight as to cause little uneasiness, and to permit of his delaying his application for medical advice until the disease has reached the stage of softening or of cavities. For this tardy application for advice, medical men are surely not responsible. By the way, it may be here suggested, that the welfare of the patient would be promoted by medical men recommending a full physical examination of the chest in any case of recent cough, or of shortness of breath lasting beyond a few days.

In our own experience, we have found that detection of pulmonary consumption would in some cases have been accomplished earlier than has really happened, but for reluctance on the part of medical men to subject patients to what has appeared at the time an unnecessarily strict and formidable examination. There has been a fear of making "much ado about nothing."

To prove the position—viz., that his professional brethren are wanting in skill in respect of such signs as dulness on percussion, tubular breathing, and increased vocal resonance, Dr. Bennett, as it appears to us, very unnecessarily and with some degree of bad taste, recites several examples of phthisis that had been overlooked by other practitioners, and that have been at length diagnosticated by himself and others.

The diagnostic importance of bronchitic signs as preceding and masking tubercular disease of the lungs, obtains some notice. It is very true that bronchitic signs, such as sibilus and sonorous rhonchus, occasionally occur early in phthisis, but ere long, the presence of phthisis is satisfactorily made out by the state of the general health, local deficiency or harshness of respiration, and dulness on percussion.

The presence of elastic lung fibre in the sputum has been ascertained by Dr. Bennett, when no auscultatory signs of phthisis could be found, and in cases which have subsequently proved to be phthisical. The author, therefore, is impressed with the importance of the examination of the sputum whenever there is suspicion of phthisis, and when the physical signs are absent or obscure. The sum of our experience in respect of the curly fibre in the sputum is this. We have never found it earlier than the period of softening, and it is more frequently and more abundantly found when cavernules are first formed, than when cavities are old and have attained to a considerable size, and have assumed a condition of inactivity.

"The cracked pot sound" is dealt with at considerable length, but the tendency of Dr. Bennett's observations is really strongly opposed to the value of this sign as diagnostic of phthisis, although in his preface the author states that he draws attention to this point, it is true with others, as it may serve in difficult cases to render the malady recognisable with greater certainty and precision. Dr. Bennett, more than any other writer, believes in the great frequency of this sound. He has heard it in a considerable proportion of persons in health, of persons suffering from pleurisy, hardened lung surrounded by healthy tissue, and in congestion. Dr. Bennett, with the aid of a pleximeter and hammer, the mouth of the examinee being open, satisfied himself of the presence of cracked pot sound in no less than twenty-nine out of one hundred patients taken indiscriminately and suffering from various diseases, in the wards of the Royal Infirmary of Edinburgh. "One ward contained nothing but skin diseases, with very few pulmonary complications."

The results of Dr. Bennett's inquiries are greatly opposed to those of other physicians, and seem to suggest the operation of some error. The sound denominated cracked pot sound surely cannot be the same thing meant by other auscultators, or it must have been produced by the instruments employed. Louis long ago heard a sound called cracked pot sound in a case of pneumonia, and in a case of pleurisy with effusion, and the clink has been occasionally heard by other physicians. An approach to the cracked pot sound we have ourselves heard to proceed from the chest of children affected with very little chest disease, or even with the chest in perfect health. But the resonance here was full, and the duration of the percussion sound was much longer than the cracked pot sound of phthisis. We believe, despite what Dr. Bennett states, that the genuine cracked pot sound is seldom heard except when a cavity of considerable size, with a thin anterior wall, capable of being driven in by the finger or pleximeter, is present. When cracked pot sound is duly elicited, a little further evidence, excluding the presence of pleurisy with effusion and hardened lung, and in harmony with the disease, may be held to be pathognomonic of an old tubercular cavity. Of forty patients suffering from various forms of chest disease, but chiefly from phthisis in an advanced form, at present under our care, cracked pot sound in a decided form is heard in only two. Both patients are young men, in the third stage of phthisis, wasted, and in whose cases cavernous dry respiration, cavernous pectoriloquy, and very dull percussion, are marked signs. Our own experience of this sign is in perfect accord with the statements of Dr. Cotton, contained in a paper on this sound published in the 'Lancet,' in 1857. This careful and judicious physician says that "The true *bruit de pot fêlé* is in the adult a certain sign of pulmonary excavation."

The only novelty we perceive in the treatment of phthisis in the present work, is the application of remedial means to the nasal passages. Dr. Bennett upon this subject has the following observations.

"Very shortly after I had commenced the local treatment of the pharynx and larynx, it became apparent to me that follicular diseases of the mucous membrane frequently extended upwards behind the soft folds, into the nasal passages. In addition therefore to sponging the pharynx and larynx with the nitrate of silver solution, I directed the instrument upwards, so as to reach as much as possible of the mucous membrane that lay behind the velum pendulum palati. For this purpose I bent the whalebone in different curves, and caused the sponge to be flattened or pointed as the nature of the individual case required. I was thus frequently enabled to produce a cure, when sponging in the usual way had failed. (p. 216.)

When the disease is present at a point in the nasal passages too high to be reached from the mouth, Dr. Bennett applies his topical remedies by the nostrils. He relates a case in which he effected a cure in this way, and in which disease of the chest had been produced by irritating discharge finding its way into the pharynx. We approve highly of this mode of dealing with diseases of the nasal passages, but we have no reason to believe that maladies of the nasal passages are either very common in phthisis, or that they need become, except very rarely, subjects of special regard in the treatment of pulmonary consumption, a disease to the pathology and treatment of which this work is avowedly devoted.

The author, in the course of his work, evinces his usual ability, but we have thought it necessary to allude to the questionable taste which permits him to speak rather unhandsomely of his professional brethren. If his work should come to a third edition, we would be glad to find it free from a blemish in the present one—viz., an ill-natured reference to Dr. Williams, whose character and services are too well known, and too generally acknowledged, for the statement referred to, to be otherwise than disagreeable to the profession.

Dr. Timms is sensible of one defect of his work on consumption, "its true nature and successful treatment," for at the outset he informs us, that the reader

> "Must put up with a new set of thoughts upon a hackneyed subject, with the elucidation of a mystery hitherto concealed; and if he find the demerits of ill-digested arrangement and inelegant composition, he will look leniently upon them; for he will consider the only way in which a busy London practitioner can write—not waiting till he is in the vein, but in snatches, at odd times and moments, with a thousand interruptions, or stealing the time he ought to devote to sleep."

Whoever takes the pains to read this paragraph, and makes the necessary effort to understand its meaning, will be ready to confess that the author has not done his literary merit an injustice. We have become painfully conscious of the involved and ambiguous style of the author, and in order that no injustice may be done him, his own words will be employed as far as possible in this notice. Mere inelegance of expression is readily overlooked when the facts and reasoning are possessed of value, but we regret to say that neither the theory of consumption nor the treatment of the disease offered in this pretentious work, is of a character that can be reconciled with sound pathological observation or with the results of practice.

The book is highly speculative, argumentative, and ambitious; it is furnished neither with a table of contents nor with an index, and notwithstanding that the corrections for the press have been superintended by "Dr. Palmer," it is an exceedingly imperfect literary performance.

The "true nature of phthisis," as understood by Dr. Timms, consists in the results of destructive secondary assimilation accumulating in the blood and being precipitated from it into the pulmonary tissue. But perhaps Dr. Timms will best explain his own views. He says:

> "Most persons have noticed in themselves a more copious throwing off of cuticular scabs at one time than another—that their skin has been more scurfy at one time than another; in like manner, it is easy to conceive that all the tissues, as well as the cutis, in certain disordered conditions, may be throwing off more effete atoms at one time than another. Now, if effete atoms be thrown off from the tissues in greater quantity than the excreting organs can get rid of, the blood must at length become saturated with them, to the depravation of the whole current of the circulation. And this is the condition which we believe precedes and originates the deposition of tubercles—that

tubercle is a deposit from their solution in the blood of devitalized atoms of animal structures, thrown off in greater quantity than the excretory organs can get rid of." (pp. 23, 24.)

To this view of "the *true nature* of phthisis," we would simply oppose the fact that exercise and activity of body, which heighten destructive assimilation, are not found to promote, but, on the contrary, to prevent the deposition of tubercle.

In a chapter on the *Age* and Locality of Consumption, Dr. Timms explains the age distribution, so to speak, of this disease, thus—

> "It is between the termination of growth and the commencement of the exercise of the reproductive function, that there is thrown upon the excretory organs the onus of expelling the increased excretable material—the residue of a too active nutrition required no longer for the extension of the tissues, and not yet employed to supply the requirements of reproduction." (p. 28.)

But we know that tubercle is by no means an uncommon formation long before the conclusion of the period of growth, and that the reproductive organs assume activity at an age long before consumption has ceased to be commonly developed.

The author is extremely unfortunate in his explanation of tubercle being deposited in the lung—

> "No doubt," he says, "the peculiar nature of the pulmonary tissue, and its free communications with the surface, by which the deposit might be easily expelled, determined its selection by the all-wise Master Builder, rather than organs closed in on every side. But Supreme Providence does not work arbitrarily. What is the immediate cause which determines the deposit to the lung? The benefit of the sufferer is the end." (p. 31.)

How the sufferer is benefited by the selection of the lung in preference to other organs, is not very satisfactorily proven. But an attempt is made to explain why tubercle is more frequently deposited in the lung than elsewhere. The author attributes much of the result to the great vascularity of the lungs, and to the great velocity of the circulation through them.

> "But this is by no means the chief cause. The returning current of blood, collected from all the structures of the body and laden with their detritus, goes direct to the lungs, and before yielding up any of the other results of destructive assimilation and metamorphosis of tissue to the great excretory organs, the skin, liver, and kidneys, first of all, and whilst still in the lungs, parts with its carbonic acid. Now we know that the mere escape of carbonic acid itself will precipitate earthy phosphates from their solution; earthy phosphates are an important ingredient in tubercle, therefore the withdrawal of carbonic acid from the blood in the lungs is one cause at least—from the loss of its solvent power—of the frequency of those organs being the seat of tuberculous deposit." (p. 32.)

The phosphates cannot be regarded as essential elements of tubercle, and the proportion in which they are found is so small as to be conclusive that they perform no important part in its constitution. If this mere chemical theory were correct, we would naturally expect that as the supply of oxygen is reduced, as the great function of respiration becomes imperfect, we should have limits set to the development of consumption. But we need scarcely say that a pure atmosphere and active respiration are the best safeguards against this evil, in the opinion of all physicians whose minds are not perverted by the influence of theory.

Dr. Timms, however, actually believes that an increased consumption of oxygen favours the progress of phthisis, and that the inhalation of this gas promotes the development of the disease, and that this result is accomplished by increasing the destructive assimilation of the tissues.

Unhappy in his views of the true nature of phthisis, the author becomes positively dangerous in his treatment. When we mention that Dr. Timms has a high opinion of the employment of frequent small bleedings, of tartrate of antimony, of mercury carried to salivation, of the frequent use of emetics, and of colchicum, and recommends them as the most important items in the treatment of pulmonary consumption; our readers, we believe, will conclude they have learned enough of Dr. Timms' 'Consumption, its True Nature and Successful Treatment.'

Dr. Hogg's work is one of extreme modesty, and is remarkable for good plain sense, if deficient in originality and talent. The author tells us in his preface, that—

> "Born and bred in the west of Cornwall, where consumption prevails to a fearful extent, and the first five years of my professional career having been passed in my native place, the havoc caused by the disease among my friends and schoolfellows did not fail to make a painful impression upon me. This first directed my attention to the subject."

Dr. Hogg's views on the predisposing causes of phthisis are much the same as those of the best and most experienced writers on the subject. The inherited strumous diathesis, birth at a late period of life of the parent, consanguinity of parents, and dry-nursing, are brought under review as frequent predisposing causes. In the chapter headed "Predisposing Causes," considerable space is given to the consideration of the symptoms and even the physical signs of the early period of the disease, which would have been more appropriately discussed under another heading.

The chapter on the exciting causes is a long one. On climate we discover nothing new, and the observations under this head are certainly crude. "Cold and wet" act as frequent exciting causes.

> "Next to climate," says Dr. Hogg, "exposure to cold and wet may be considered the most frequent exciting causes of consumption. This is the prolific cause in young men just arriving at manhood, and many are the instances in which parents look back to the wetting their son experienced some months previously as the beginning of his now serious illness. The clothing becoming wet, either by exposure to rain or by the person's falling into water, especially when he is compelled to remain inactive for some time immediately after, as by sitting in a boat or open carriage, is most dangerous."

In illustration of the influence of cold and wet, Dr. Hogg gives the history of the illness of a friend of his own, who by exposure to the cold and damp of a railway tunnel, the construction of which he superintended, became affected with consumption. The narrative, if not quite in keeping with the conciseness of a scientific work, exhibits in a favourable light the amiable disposition of the writer.

The medical treatment is sensible, and such as has been found by others to be the most successful—viz., reparative and palliative; it differs extremely from the medication of Dr. Timms, to which it is greatly superior. The chief novelty which is to be found, is the external application of potassio-tartrate of antimony. When this medicine is applied in the form of an ointment, Dr. Hogg says it soon produces smarting, and the rubbing is discontinued before a full effect is produced. The form employed by Dr. Hogg is that of a plaster, and it seems worthy of a trial. The following is the mode of preparation recommended:

> "On a newly-spread Burgundy pitch plaster, say six by four, the plaster being still warm, and not set, sprinkle four grains of tartrate of antimony, rubbing it well into the substance of the plaster with the fingers, or, if necessary, gently passing the warm spatula over the surface." (p. 182.)

The author states that—

> "After a period ranging from five to ten days, according to the temperament of the person, the irritation amounts to smarting and absolute pain, when it should be removed. A plentiful crop of pustules is the result, perhaps of fleshy buttons, varying from the size of a half pea to that of a sixpence."

Simple dressing is recommended. This local treatment, the author finds extremely efficacious in the removal of cough immediately or within two or three days. We would not advise this treatment in persons of very irritable habit, or who are very emaciated.

To conclude, we would say that Dr. Hogg's book has little pretension to be considered an addition to our scientific knowledge; but it contains much information, though indifferently arranged, which would profit a young practitioner or a non-medical reader, for whom indeed, more than the scientific physician, it seems to us to be calculated.

The work which Dr. Gibbs presents to the profession contains thirty-two chapters, and in each of them, we venture to say, an excellent *résumé* of the current knowledge of the subjects respectively treated of will be found; but in addition to this, in many of them entirely new matter of very considerable value is to be obtained. This is the smallest book in point of bulk of the series under notice; but we are sensible that its perusal will afford instruction to almost any member of the profession. The descriptions of throat disease are faithful; the data are numerous, the pathology is sound, and the treatment is rational, and likely, when faithfully carried out, to be successful. The author has full confidence in the means he recommends, most of them being those already in general use, and a few entirely new, yet we are much pleased to observe a complete absence of that laudation so painfully conspicuous in the work of Dr. Timms.

A very pleasing feature marks this work—viz., the constant acknowledgment of the labours and observations of other writers. In almost every page the name of a *confrère* is to be found, and with a large proportion of the practitioners referred to, the writer appears to be upon terms of kindly and intimate acquaintance.

The style of the composition is most precise and condensed. The arrangement adopted is well adhered to, and the time of the reader is not wasted by diffuse or irrelevant writing or by useless repetitions.

The chapter on follicular disease is sensible. The description of the membrane is as follows: The appearances which are at first noticed are, general enlargement of the mucous follicles at the posterior part of the pharynx, which stand out on a red membrane in places deprived of its epithelial covering, giving to the whole a "raw or granulated aspect." Frequent hemming characterizes this complaint, and if the disorder reaches the larynx, the voice becomes hoarse or extremely weak. Dr. Gibbs, like other observers, has not found cough a constant attendant. The local treatment pre-eminently useful, is the solution of nitrate of silver, of the strength of from two to four scruples of the salt to an ounce of water. He recommends the application, by means of the sponge and whalebone, about every second day. When the larynx is to be entered by the sponge, the glottis and adjoining parts are gradually "educated" to receive the solution for some days, and then the introduction of the solution into the larynx is effected. When irritation is subdued, Dr. Gibbs has found the application of olive oil, as recommended by Dr. Alison, to afford "great comfort to the patient." The chief constitutional treatment recommended is the internal employment of iodine combined with a tonic. The doses recommended are moderate. Alterative doses of mercurials are to be given, and, when needful, purgatives are to be associated with them. We ourselves have found the administration of alkaline preparations of great service, combined with hydrocyanic acid and vegetable tonics when irritation and debility of the stomach have been present. We have found follicular diseases frequently dependent upon constitutional errors of a gouty or rheumatic character. This was prominently brought before the profession by Dr. Gueneau de Mussy in his excellent work on 'Angine Glanduleuse,' published by that French physician some years back, and reviewed in this journal. Dr. Gibbs does not appear to be aware of the existence of this treatise. The necessity of avoiding the use of snuff is not insisted upon by Dr. Gibbs.

In treating of chronic disease of the throat, Dr. Gibbs gives a good description of that extensive ulceration which not unfrequently takes place. The parts which are exposed to the ravages of ulceration are the thyroid, cricoid, and arytenoid cartilages, the epiglottis, and the rings of the trachea. Besides these, the delicate muscles and ligaments—the latter including the vocal cords—participate in the morbid action, and add to the general complexity of the disease. The ulcerative process gradually eats into the attachments of the cartilages, which produces at first a partial displacement, especially of the arytenoid, which seriously embarrasses the breathing; in the meantime this destruction goes on, ending in a state of necrosis or death, and finally they are thrown off and expelled. (p. 23.)

The period of displacement is one of great danger. Suffocation is suddenly threatened in some cases. According to the author, besides chronic follicular disease, the excessive employment of mercury, and syphilis produce necrosis of the cartilages. In the treatment of this pathological condition, Dr. Gibbs has some original suggestions to offer which seem deserving of attention. He recommends, when life is being endangered by emaciation and hectic fever, and when treatment by medicines fails to confer advantage, that openings be made into the trachea and larynx, with the twofold object of removing dead cartilage and of applying local remedies, and of meeting the danger of suffocation. The opening into the trachea relieves the dyspnœa. Another opening is to be made through one of the wings of the thyroid cartilage, in order to extract large portions of necrosed cartilage. The opening into the trachea may be kept patent for the purposes of respiration, while the wound at the thyroid cartilage, at any subsequent period, may be closed by a plastic operation. We see no absolute objection to the procedure recommended under the circumstances described, but it does not appear that Dr. Gibbs has ever put this plan of treatment into practice. Of course so important a step must not be lightly undertaken; there must be either danger of suffocation or a deteriorating state of health full of danger to life, to justify this surgical interference. This chapter is worthy of earnest consideration, for there is no doubt that lives are lost from extensive destruction of the cartilages, causing suffocation. The intractable nature of this disease is painfully impressed upon every physician who sees much disease of the throat; and we are therefore glad to observe any reasonable proposal for its relief. When the operation is proposed as a curative means, it would be necessary to ascertain that the malady is not the result of advanced tubercular disease of the lungs. The treatment of that form of chronic laryngitis which attends phthisis that has been most useful in the practice of the author, is the local application of nitrate of silver, olive and cod-liver oil, and a mixture of glycerine and borax. "The sponge probang slips into the larynx with great facility when loaded with any oily fluid, and the patient expresses himself as most sensibly relieved by it." (p. 43.)

The chapter upon œdema of the glottis is very judicious, and contains a recommendation, before resorting to tracheotomy, of Lisfranc's plan of making small punctures in the œdematous parts, to permit the discharge of the fluid. This method was employed by Mr. Busk.

> "Numerous minute punctures were made with a sharp-pointed bistoury into the back of the tongue, the uvula, and the pharynx, and repeated every two or three hours. The relief is stated to have been sudden and decisive, as a great quantity of serum was discharged. Warm-water gargles were employed during the intervals." (p. 124.)

Dr. Gibbs has met with gout in the throat. In a severe case which came under his observation, the symptoms were those of intense laryngitis, commingled with general faucial inflammation. The patient had been subject to frequent attacks of gout in his great toe. The local manifestation of constitutional disease, of which this is an example, is by no means rare, and indicates the great importance of ascertaining the constitutional tendencies of his patients, even when the physician is called in to treat what the patient believes to be only a local disorder. In obstinate local complaints, it will be frequently found upon diligent inquiry that the persistence of the malady is due to constitutional error, upon the removal or correction of which the patient is immediately relieved.

The affections of the throat common in small-pox, measles, and syphilis, are described; diphtheria is well sketched, and the treatment recommended is the same as has been generally found useful—viz., the local application of hydrochloric acid, nitrate of silver, and the internal administration of chlorate of potash. Cancer of the tonsils is noticed, but we fail to see any mention of epithelial cancer of the larynx—a subject which has been described by Dr. Pollock of the Consumption Hospital, and by other physicians.

The work of Dr. Gibbs concludes with a few observations on some accidents which we presume will be new to most of our readers—viz., dislocation of the tongue-bone, hydrarthrosis of the thyro hyoid articulation, and fractures of the cartilages of the larynx.

Dr. Gibbs refers to a speculum employed by his friend Mr. Price, and gives a woodcut of it. Now, it appears to us that though the instrument—a mere steel mirror at the extremity of a handle some five inches long—is very useful, it is an omission not to mention that this aid has been long employed. Liston recommended it. Moreover, it has been much improved upon by later practitioners. Garcia employed auto-laryngoscopy by means of a mirror in the mouth and another outside, on which latter an image of the larynx was exhibited. Mr. Avery, of London, employed a laryngoscope consisting of two mirrors, one introduced into the mouth, and another outside, which served to reflect the light of a lamp to which it was attached. Some years ago we saw this in use at the Hospital for Consumption, in the hands of Dr. Pollock, and we ourselves have since used it. Czermack's improvement of the laryngoscope has been lately brought much before the profession. The outside mirror is perforated, so that the observer looks through the mirror, and not at its side, and it is held in the mouth of the explorer. Ingenuity has been busy in this direction of late. Some days back we saw Dr. Quain employ at the Hospital for Consumption an ingenious modification of Czermack's instrument. Instead of the reflecting mirror being held between the teeth, it is fixed before the eye like a common eye-glass or pair of spectacles. When the head moves, the mirror moves also, and the perforation and the eye are well maintained in their relative positions. We may mention that in the case of many persons, the simple hand speculum answers better than any of the more complicated instruments. The intolerance of contact on the part of the fauces, &c., renders a rapid and simple exploration very desirable.

We recommend this book as containing a sensible and well-written account of most disorders of the throat. The treatment recommended is essentially practical: it is moderate yet efficient. To many of the profession this small volume would prove in the hour of anxiety a valuable resource.

To write a clear and faithful description of a disease often misunderstood, so that it shall be readily recognised and be distinguished from other maladies, is certainly a valuable service. There is no doubt that in reference to asthma much error exists, both amongst some practitioners and a large number of the public, and Dr. Hyde Salter's book is eminently fitted to correct this.

The doctrine that asthma is a nervous and a spasmodic disease, which is maintained by Dr. Salter, is one that was fully recognised and taught by Dr. Cullen forty years ago. It is the doctrine adopted and taught by nearly all scientific medical writers at the present day. Many of the most important clinical facts given by Dr. Salter are to be found in the writings of Dr. Cullen, Dr. Mason Good, and Sir John Floyer. Even the evil influence of the non-operation of the will in sleep, upon which Dr. Salter dwells so properly, is distinctly noticed by Dr. Mason Good. With the exception of nitre-paper fumes and chloric ether, scarcely a remedy is mentioned by Dr. Salter which has not been discussed in connexion with this disease by the most esteemed writers during the past forty years. The employment of oxygen gas, which Dr. Salter suggests, and of which he states that he has been unable to find any mention, was long ago tried and strongly recommended by Dr. Beddoes. This author graphically writes: "No sooner does it (oxygen) touch the lungs, than the livid colour of the countenance disappears, the laborious respiration ceases, and the functions of all the thoracic organs go on easily and pleasantly again."

We have been induced thus *in limine* to notice this matter, to do a simple act of justice to our immediate predecessors and teachers. When we recall the descriptions of Cullen, Mason Good, and many others, after perusing Dr. Salter's work, written with great care, and, as it were, with a photographic faithfulness, we feel an unaffected respect for our professional brethren of days gone past, and for medical science as it was half a century ago. In those days there were able minds labouring in the field of medical science, there were truthful and accurate describers, and many valuable results were obtained. The industry of modern inquirers, and the aid of various instruments for investigation, have done no more than add, in many cases very moderately, to the knowledge of our forefathers. These remarks are made, not to disparage the valuable contribution of Dr. Hyde Salter, but to point out how much had been previously accomplished, and to show how proper and necessary it is to peruse the works of those who have gone before us.

Asthma has certainly, as Dr. Salter maintains, been frequently, and is still frequently, confounded with other diseases by medical practitioners, but this is due much more to the carelessness of the practitioner, than to the shortcomings of his teacher, or of the works upon the practice of physic. The medical practitioner finds a person affected with dyspnœa, occurring in paroxysms; the patient is much easier at one time than another, he has no constant fever, and is troubled with cough and expectoration, and diffused impulse of heart. The practitioner concludes the case to be one of asthma. But here it is clear, if an error is committed, and bronchitis, with dilatation of the heart, marked with distress occurring in paroxysms, is mistaken for asthma, the fault does not lie with medicine; it lies with the practitioner of it; not with the science, but with the individual. Were the practitioner carefully to examine the condition of the lungs, bronchiæ, and heart, attend to the narration of his patient, and compare the facts now obtained with the descriptions of Cullen, Mason Good, Williams, Watson, and many others, no mistake would occur.

Though it may be gathered from the above observations that much has been already done to elucidate the nature of asthma, we are ready to admit that Dr. Hyde Salter's work is a valuable addition to the literature of the subject. The pathology of the disease is faithfully carried out to the very utmost limit that morbid anatomy, the present state of physiology, and other connected branches of natural science, will permit. The discoveries of Dr. Marshall Hall in connexion with the excito-motory functions, are happily applied, not only in the elucidation of the phenomena of the disease, but also practically in the treatment of the malady. Dr. Salter's views on the pathology of asthma had been previously published in an able paper in this journal. The clinical history of the disease is, as it were, a photograph of the malady, We recommend it to any one who is ambitious to describe disease. It is as if Dr. Salter had sat down before his patient, and had with the utmost patience sketched every feature, every posture, and, as it were, every sensation, of the sufferer. The causes of the disease and the consequences are indicated with a truth that any well-informed physician who has seen much of the disease must admit is most accurate and painstaking, and in a manner that leaves little to be desired by the earnest student of the malady. The treatment is happy. With the aid of chloric-ether inhalation, nitre-paper fumes, the depressing action of tobacco and tartar emetic, Dr. Hyde Salter will relieve no small proportion of cases of paroxysmal asthma in a very short time. For the treatment of asthma in its intervals, he offers no small comfort. He properly regards this as the chief treatment of the disease. By the selection of the (for the individual case) anti-asthmatic atmosphere, a regulated moderate nutritious diet, warm clothing, abstinence from food before sleep, the use of tonics, the shower bath, &c., he almost promises immunity from the disease, when no persistent bronchitis, no œdema of the lungs, or dilatation of the heart, have taken place.

Before concluding these general observations on Dr. Hyde Salter's book, we would notice some peculiarities of the work. There is to be found evidence of great and sustained and patient and exact thought. Thoughtfulness is to be found in every page. The subject is treated with an excellent independence of mind. Authority with Dr. Salter is as nothing compared with fact. There is no vestige of assumption or of painful depreciation of other men's labours. A thread runs through the work, connecting every part and maintaining every part in its proper place. No work was ever more free from fine writing or stilted rhetoric, yet no work tells more upon the mind of the reader, for he sees the description and understands the reasoning, of a thoughtful, exact, and honest physician. To come to less important features, we are struck very agreeably with the sober, chatty, anecdotal character of the book. A fund of humour may be discerned; it is not paraded. The cases he relates would entertain the ordinary subscriber to a circulating library, yet they are instructive to the correct and "sad" physician. Numerous hints of a highly practical nature in respect of the preparation and mode of employment of the various means of treatment, both therapeutical and dietetic, abound in the book; at once proving the author to be a highly practical physician, and lending an original and useful character to his work. In the preparation of the cup of coffee, and even in the choice of tobacco for the pipe, Dr. Salter's advice will be found very useful. We fear Dr. Salter has himself suffered from the disease he so well describes. If so, we think he has turned his personal sufferings, like many other physicians, to the advantage of the many.

We now propose to give a *résumé* of some of the chief views and descriptions of Dr. Salter. With respect to the pathology, the author maintains—1. That asthma is essentially and, with perhaps the exception of a single class of cases, exclusively a nervous disease. 2. That the phenomena of asthma immediately depend upon a spastic contraction of the fibre-cells of organic or unstriped muscle, which minute anatomy has demonstrated to exist in the bronchial tubes. 3. That these phenomena are those of excito-motory or reflex action. 4. That the extent to which the nervous system is involved differs very much in different cases, being in some cases restricted to the nervous system of the air-passages themselves. 5. That in a large number of cases the pneumogastric nerve, both in its gastric and pulmonary portions, is the seat of the disease. 6. That there is a large class of cases in which the nervous circuit between the source of irritation and the seat of the resulting muscular phenomena involves other portions of the nervous system besides the pneumogastric. 7. That there are other cases in which the source of irritation, giving rise to the asthmatic paroxysm, appears to be central—in the brain; consequently, in which the action, though excito-motory, is not reflex. 8. That there is yet a class of cases in which the exciting cause of the paroxysms appears to be essentially humoral.

The description of the asthmatic in a paroxysm of his disease is worthy of reproduction here:

"When once the paroxysm is established, the asthmatic offers a very striking and very distressing spectacle. If he moves at all, it is with great difficulty, creeping by stages from one piece of furniture to another. But most commonly he sits fixed in a chair, immovable, unable to speak, or even, perhaps, to move his head in answer to questions that may be put to him. His back is rounded, and his gait stooping; indeed, his whole figure is deformed. His chest, back, shoulders, and head are fixed; he cannot even turn his head from side to side, but when he looks from object to object, merely turns his eyes, like a person with a stiff neck; his shoulders are raised to his ears, and his head thrown back and buried between them. . . . . At every breath his head is thrown back, his shoulders still more raised, and his mouth a little opened, with a gasping movement; his expression is anxious and distressed; the eyes are wide open, sometimes strained, turgid, and suffused; his face is pallid, and, if the dyspnœa is extreme and long, slightly cyanotic; the labour of breathing is such that beads of perspiration stand on his forehead, or even run in drops down his face, which his attendant has constantly to wipe. If the bronchial spasm is protracted and intense, the heat of the body falls. . . . . I have known the whole body deathly cold, and resist all efforts to warm it for four hours." (p. 71.)

Asthma, according to Dr. Salter, may occur at any period of life, from the earliest infancy to old age. At an early age it is not uncommon. In 38 cases in which the period of the first access of the disease was noted, the commencement of the malady took place in one at fourteen days old, in another at twenty-eight days, in another at three months, in another at one year, and in three during the first year, the exact time not being remembered.

The description of the *physique* of asthma is remarkably good. The antero-posterior curvature of the dorsal spine is referred to. The muscles of the back, now unduly engaged as respiratory muscles, are unable to act as erectors of the spine. The pigeon-chest is well described and correctly explained. The explanation is much the same, however, as that given by Dr. Gairdner of Edinburgh, in reference to the same distortion—the result of bronchitis. An excellent woodcut represents this deviation from the natural form of the thorax. Dr. Mason Good states that "Lommius asserts, after Hippocrates, that if a person becomes gibbous before puberty, in consequence of asthma, he dies;" and Dr. Mason Good adds, "on which Dr. Bree has well observed, that the authors have here substituted the cause for the effect, since it is rather the gibbosity that causes the asthma than the asthma that causes the gibbosity." It is curious to observe here that the elder authorities are the more correct in their pathology, since, contrary to what Dr. Bree says, it is really the asthma, or dyspnœa, at least in most cases, that causes the gibbosity.

The exciting causes of asthma are found by Dr. Salter to be—1. Irritants admitted into the air-passages in respiration. 2. Alimentary irritants (errors in diet). 3. Sources of remote nervous irritation. 4. Psychical causes. These sources of the disease have been long recognised. Dr. Salter refers to the exhalation of grass when in flower (particularly the *nardus stricta*), to the exhalation from rabbits and cats, from the poulterer's shop, and from ipecacuanha. Ipecacuanha dust was, we believe, first noticed as a cause of asthma by Dr. Scott of Northumberland, many years ago. Musk has been known to produce a paroxysm of the disease, and Timæus relates a case of this malady that was induced by the smell of roses. Dr. Salter refers to a case of asthma in which venereal excitement induced paroxysms. This exciting cause had been previously noted, however, for we find that Cullen, in his 'Nosology,' has a species of the disease designated *asthma venereum*.

We have already occupied so much space with the notice of Dr.

Salter's book, that we must pass over much that is highly interesting in connexion with the consequences of the disease, and apply ourselves to the consideration of the treatment recommended. Some excellent general directions precede the discussion of mere medicinal agents, and as they are not generally to be found in medical works, they claim attention here.

> "The first thing to be done," Dr. Salter says, "on being called to a patient in a paroxysm of asthma, is to ascertain if there is any exciting cause actually present and in operation. An undigested meal or a full rectum may, as peripheral irritants, produce bronchial spasm; the one I think through the pneumogastric nerve, the other through the sympathetic, and thus an emetic which relieves the one and an enema (or any other means) which evacuates the other, may put a stop to the attack. Ascertain too the state of the air he is breathing, if there is in it any known or unknown irritant, any of those subtle emanations of which asthmatics are so sensible; if there is a hay field near, or ipecacuanha powder in the room, or dust or smoke, and if so, let the removal from these influences be the first step taken. Let it be your first care too, to place your patient in a favourable position; get him out of bed, and bolster him up in an arm-chair, and place before him a table of convenient height, with a pillow on it, on which he may rest his elbows and throw himself forward." (p. 163.)

For the treatment of a paroxysm of asthma, Dr. Salter prefers depressants, and of this class his special favourites are ipecacuanha, tartar emetic, and tobacco. He believes these remedies act by relaxing the spasm of the bronchial tubes. Ipecacuanha is given in full doses of some twenty grains, and it may prove useful before vomiting is induced. Tobacco has been found by Dr. Salter to be efficacious: it is employed in the form of smoke. It is as a depressant that it acts, for the benefit is proportioned to the poisoning *quoad* collapse, which is induced. It is for this reason that it is most useful in persons unaccustomed to smoking, or who cannot tolerate it as a luxury. A few whiffs of a cigar have sufficed to induce the curative collapse, and to bring to a speedy conclusión the sufferings of the patient. For the reason that women and children do not ordinarily smoke, they derive most benefit from this mode of treatment. Habitual smokers are beyond the operation of this herb as a curative agent. Dr. Salter recommends a pipe in preference to a cigar, and bird's-eye tobacco as being mild. He employs it himself. Tartar emetic has proved of great service, but the collapse is tedious and very distressing.

The treatment of asthma by stimulants engages Dr. Salter's attention. He believes they operate much by keeping the patient awake. Mental emotions, such as fear, act in the same way, and thus invariably oppose reflex action. Coffee has been found very useful in a large proportion of cases in Dr. Salter's practice, as in that of other physicians, for it is an old and popular remedy. Dr. Salter refers much of the advantage derived from it to its well-known antagonism to sleep, which favours reflex action. Coffee, Dr. Salter tells us, should be given without sugar and milk—pure *café noir*, and it should be given on an empty stomach, very hot, and in small quantity.

Of the ordinary sedatives Dr. Salter expresses himself rather unfavourably. From tobacco in sedative doses—not collapsing or depressing doses—he expects no good. Stramonium-smoking is sometimes useful. Opium he has seldom seen beneficial, and he believes it calculated to do harm, by inducing sleep. Lobelia the author has lately ceased to employ, being very doubtful of its efficacy. Indian hemp he has not exhibited: from its hypnotic tendency it might be injurious. Ether has been productive of good only in one case, although the author has exhibited it in scores of cases. Chloroform inhalation in moderation, and guardedly exhibited by a medical attendant, is recommended as likely to be useful.

We are disposed to believe that opium in soothing doses, especially combined with chloric ether or the compound spirit of sulphuric ether, is not to be lightly thrown aside. When the suffering of the patient is intense, and when there is no disposition to stupor or cerebral congestion, we are of opinion that it may be safely and advantageously administered. We have seen in numerous examples of the disease the happiest results from its employment. Let us for a moment turn to the experience of one of the soundest and safest of physicians. Dr. Cullen says:

> "As in other spasmodic affections, so in this, the most certain and powerful antispasmodic is opium. I have often found it effectual, and generally safe; and if there have arisen doubts with respect to its safety, I believe they have arisen from not distinguishing between certain plethoric and inflammatory cases of dyspnœa, improperly named asthma, and the genuine spasmodic asthma we treat of here."

The good effects of opium which Dr. Cullen observed he could doubtless satisfactorily explain, for he writes:

> "From the whole of the history of asthma now delivered, I think it will readily appear that the proximate cause (the 'absolute cause' of Dr. Salter) of this disease is a preternatural and in some measure a spasmodic constriction of the muscular fibres of the bronchiæ, which not only prevents the dilatation of the bronchiæ necessary to a free and full inspiration, but gives also a rigidity which prevents a full and free expiration."

Words, by the way, almost identical with those of Dr. Salter.

For most useful information on the curative influence of London air and the atmosphere of other cities, on the advantages of nitre-paper fumigations, and on the hygienic and regimenal treatment of asthma, we must refer to the work itself.

We find few statistics of asthma in this work. Little or no notice is taken of external applications; these we have occasionally found to be serviceable. The comparative prevalence of this disease in different countries seems well worthy of consideration, though we confess to the difficulty which the vague employment of the title of the disease must necessarily cause. The returns would depend doubtless as much upon the skill and care of the physician as upon the actual frequency of the disease. Still we hope to see some effort made in this direction. The omission of Dr. Beddoes' trial of oxygen gas, and of the experiments of other physicians with various gases, should be remedied in the next edition.

We would conclude by recommending those members of the profession who have occasion to treat cases of dyspnœa, to place this excellent work in their library. Dr. Salter has greatly added to his reputation by the present effort, which it is evident he has made in all earnestness, truthfulness, and judgment. We have derived unmixed satisfaction from the perusal of the volume.

REVIEW VII.

Transactions of the Obstetrical Society of London. Vol. I. *London*, 1860. pp. 284.

ON the 5th of January, 1859, a meeting was held in London, under the presidency of Dr. Rigby, to inaugurate a society, under the title of the "Obstetrical Society of London, instituted for the Promotion of Knowledge in all that relates to Obstetrics and the Diseases of Women and Children." Amongst its officers are men of the highest standing and ability, and the published list of its Fellows includes upwards of three hundred practitioners in London and in the provinces, well known as experienced and successful labourers in the wide field of obstetricy. From such an institution great good was to be expected, and all the more, perhaps, in consequence of the unaccountable fact that no society representing the art and science of midwifery had hitherto existed even in London. Strange it is that in England this department of medicine should have been so long kept in the background, and that its followers were so lightly esteemed as scarcely to have been allowed admission into the colleges and learned bodies of our profession. Happily we no longer are subject to such a reproach; our obstetric physicians and surgeons are now admitted to the highest honours in their several colleges, and enjoy a standing second to none in the Profession; and, thanks to the new Obstetrical Society, the department of which we speak has every chance of being still further advanced in knowledge, skill, and usefulness.

In former times, the act of parturition, being a natural process seldom requiring artificial assistance, was superintended by women who, either from having had children themselves, or having been present at a few labours, were supposed to be sufficiently qualified for the purpose; and perhaps we, as English people, may claim the benefit of some slight excuse for not making better provision for such occasions, on the score of the national feeling in favour of delicacy towards the female portion of our race. There is, however, such a thing as false delicacy, and we much fear that of the kind alluded to has been attended with enormous sacrifice of comfort and of life. Fortunately for the interests of those whose lot it is to undergo the pains and perils of childbirth, the difficulties frequently attendant upon parturition in civilized life led to the necessity of medical men making this part of their profession the subject of special study; and so great have been the advantages to society arising out of this better knowledge of the dangers, and more skilful treatment of the difficulties, encountered in the practice of midwifery, that well educated men are now legally provided for all classes of society, and valuable lives are no longer left to the tender mercies of—however well-meaning—still ignorant and blundering female attendants. Another great good arising from the recognition of the obstetric art as a high and honourable division of medical practice, is that it embraces in its range the diseases of women and children; and to this we think its professors probably owe much for the present high position they occupy. A physician practising midwifery is no longer considered to be merely an attendant upon a woman in labour; but, having made it his especial aim to acquaint himself with the diseases of women and children, many of which are more or less connected with the act of parturition itself, and can only be understood by those who have experience in midwifery, the sphere of his operations is vastly extended; so that besides being the safe and responsible accoucheur, he comes to be also the medical adviser in a large class of the most interesting cases that fall under the observation of a medical practitioner.

One year only has transpired since the foundation of the Obstetrical Society of London, and as a proof of the energy displayed by its members, we have now before us a goodly octavo volume of Transactions. This we hail as a valuable addition to our medical literature, and an earnest of much advancement in our knowledge of disease; for it appears to represent facts, *and no kind of information is so much wanted in our profession, or so likely to be beneficial to mankind, as a collection of well-ascertained, carefully-observed, and simply and truthfully-described facts in physic.* We will now examine its contents, and endeavour to give our readers some idea of what they may expect from the labours of the new Obstetrical Society.

The first paper in the volume is of a very interesting character, and invites discussion. The questions involved in it are—first, the propriety of inducing abortion in cases of pregnancy co-existing with cancerous disease of the rectum and vagina, likely to interfere with delivery; and secondly, the best means of effecting the operation. The patient was under treatment for cancerous disease of the rectum, consisting of a firm scirrhous contraction of the bowel about four inches above the sphincter, formed by a deposit in the coats of the bowel, which projected into its interior, of about the size and conformation of an ordinary cervix uteri. The point of the finger could just enter the constriction, which was in the centre of the deposit; and below it another scirrhous induration could be felt in the anterior wall of the rectum, which was about the size of a hen's egg, and very painful and tender on pressure. The body and cervix were found expanded to within about an inch of the os uteri, and the anterior segment of the cervix was found to be the seat of a hard scirrhous deposit of about the size of a pigeon's egg. This did not project anteriorly or externally from the cervix, but could be distinctly felt projecting into the interior of the cervical canal, just within the os uteri; otherwise the condition of the cervix was healthy.

This was the state of things which induced Dr. Mackenzie, in conjunction with others, to determine to put a stop to the further progress of pregnancy; and abortion was effected by means of injecting a few ounces of tepid water into the interior of the uterus, aided by a sustained current of electricity, after the failure of the uterine *douche.* After considering all the bearings of the case, we doubt whether we should under similar circumstances arrive at the same conclusion. As a principle, we should never destroy an ovum unless the life of the mother were compromised by not doing so. In this instance the life of the mother was not of the usual value, and would probably be of short duration independently of her pregnancy. The child might be healthy, notwithstanding the disease under which the mother laboured; although there was the chance of its being affected through the mother, in which case it might have died in utero, and have been naturally expelled from the womb before the full period. Supposing the child to be healthy, it was the more valuable life of the two; and as the pregnancy was of only fourteen weeks' duration, there could have been no harm in allowing more time to watch the progress of the mother's disease. It was hardly probable that the cancerous affection would have advanced so rapidly as to have seriously opposed delivery at the seventh month; and should it then have appeared impossible to allow pregnancy to go on without dangerous impediment to delivery, artificial premature labour might have been induced with safety to the life of the child.

A word as to the mode of effecting premature delivery. In this instance several disappointments occurred; the douche failed—it was not thought right to puncture the membranes, an opinion in which we entirely concur—the employment of sponge-tents was considered very doubtful practice, and even the injection of tepid water into the cavity of the uterus required the aid of galvanism to effect its purpose.

In a little work published in 1856,[*] under the head of "Induction of Premature Labour," p. 76, it is stated that the passing of an œsophagus bougie or tube a distance into the uterus, between its inner wall and the chorion, will so disturb the pregnancy as to induce labour without rupturing the membranes. Two instances are quoted in which success was in this way obtained, and living children born; we have also had the experience of several recent cases, in which this plan has been adopted with perfect safety both to mother and child; and considering the simple and painless nature of the operation, together with the great advantage it affords in allowing the membranes to remain intact, we have no hesitation in recommending it to the favourable notice of the profession.

The next paper in the Transactions is by Dr. W. Tyler Smith, on the Abolition of Craniotomy from Obstetric Practice, in all cases where the fœtus is living and viable. To the practical accoucheur this is one of the most important in the book, and deserves very attentive consideration. The use and abuse of instruments in midwifery is a theme worthy of strict examination, and hitherto we believe much misapprehension has existed on the subject. In the schools and in systematic works, it is laid down as a rule, that the use of instruments is never to be had recourse to if it can possibly be avoided, and young men generally commence practice under the direst fear and apprehension of committing errors in this respect. Indeed, so strictly are they cautioned against the use of instruments in midwifery, that they scarcely think it worth while to learn how to manage them; consequently, when they meet with a case requiring instrumental aid, they feel they have a great emergency to contend with without the necessary qualification to meet it; and many a valuable life may have been placed in jeopardy, or lost, owing to the indecision or incompetency of an untaught junior practitioner. Surely it would be a much safer method of teaching to make students experienced in the use of instruments, leaving it afterwards to their own judgment and sense of propriety not to abuse them, than to instil into their minds such a horror of them, that when they do meet with difficulties in practice and have to depend upon their own resources, they either shirk necessary instrumental aid, or, if driven to employ instruments, find themselves baffled, to the peril of the lives of those entrusted to their care. Dr. Tyler Smith strongly urges the more frequent employment of the forceps as one of the means of removing the necessity for craniotomy, and remarks that "there is scarcely any point in practice admitting of greater improvement than the more frequent use of this instrument in the capacity of extractor, of lever, of rotator, of compressor, and lastly, of an excitor of uterine action." He states, that "the maternal mortality, after the use of the forceps, is in this country somewhat less than one in twenty, whereas nearly one in five of all mothers die after craniotomy." Now, taking into calculation what a comparatively easy operation craniotomy is, the greater mortality attending it probably *depends more upon the consequences of pressure and exhaustion from protracted labour, than upon the operation itself*, and is a strong argument in favour of the use of the forceps at an earlier period. But the argument applies with still greater force in favour of the vectis, which can not only be used earlier in labour than the forceps, but is followed by a much smaller rate of maternal mortality, as well as of certain other unfavourable results of delivery by the forceps. The writer of this article used the vectis in private practice one hundred and twenty times, and not one of the mothers died. He has since used it in *consultation* practice, frequently after failure of the forceps in experienced hands, 56 times in 210 labours, or 1 in 3·75, with a fatal result to one mother only, and that from puerperal fever after a very prolonged labour. Scarcely ever has it caused rupture of the perineum, and in no instance sloughing or injurious inflammation of the soft parts. How is it that an instrument of such value is scarcely mentioned in systematic works, and not at all by the author of the paper in question? We know that it is very extensively used in provincial midwifery practice, and depended upon by many to the entire exclusion of the forceps; Denman, a great authority, thought highly of it, and the very argument used by those who inculcate in the minds of students the axiom that "meddlesome midwifery is bad"—viz., that practitioners are too apt to use them more frequently than necessary, implies in some degree that benefit is derived from their employment; for, undoubtedly no practitioner would frequently resort to any means of treatment which he found prejudicial to his patients, and consequently injurious to his own reputation and success. In making these remarks, however, we are anxious not to be misunderstood; we deprecate any interference with the natural process of labour when all is going on well; we disallow any excuse for instrumental interference on the score of convenience or saving of time to the practitioner; but we nevertheless agree with the opinion of Dr. Tyler Smith, that "*greater dangers accrue from the neglect of instrumental interference than from the abuse of these means*, and that the evils which result from protracted labours are now so well understood, that few obstetricians could be found who would seriously advocate the barbarous practice of keeping a woman undelivered for several hours after her delivery had become safe and practicable by the forceps."

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[*] Records of Obstetric Consultation Practice. By Edward Copeman, M.D.

There is another very interesting paper in the 'Transactions,' on The more frequent Use of the Forceps as a means of lessening both Maternal and Fœtal Mortality, by Mr. P. H. Harper, who pleads strongly, both by argument and statistics, in favour of a much more frequent employment of the instrument. He has endeavoured to show that there is no special maternal risk which necessarily attaches to the use of the forceps, and that the various injuries and other ill effects which are usually attributed to them are not the result of their use, but of their abuse. That when maternal death occurs after their use, it is generally because of the result of the length of time the labour has lasted before their application. That so long as they are applied as the last resort in tedious labour, so long will the maternal mortality after their use appear to be very high.

> "We have proved," he says, "from the only statistics which give us the necessary data, where the forceps were freely used, that 1 mother in 22, and 1 child in 5 died in unassisted tedious labour; whilst 1 mother in 56, and 1 child in 84 died where the forceps were used; and 1 mother in 10 died after craniotomy. This proves that the maternal death is less after the use of the forceps than after craniotomy, or even unassisted tedious labour."

We subjoin the following table, which tells its own tale:

	Forceps cases.	Fœtal deaths.	Maternal deaths.	Duration.
Collins	1 in 694	1 in 26	1 in 329	38 hours
Hardy	1 in 355	1 in 20	1 in 334	35½ „
Johnston	1 in 60	1 in 35	1 in 502	29½ „
Harper	1 in 26	1 in 47	1 in 1490	16 „

Dr. Waller has an interesting paper on Transfusion of Blood, historical and practical, short and comprehensive. There can be no doubt of the value of transfusion as a last resource in cases of severe hæmorrhage; but the difficulty of not having a proper instrument at hand must always be an obstacle to its general employment in provincial practice. Dr. Waller remarks, that in the performance of the operation three things are necessary to be observed. First, that great care be taken to get rid of any air that may be contained in the syringe; secondly, to introduce the blood very slowly, experiments having proved that a sudden and large supply overwhelms the action of the heart, and causes immediate death; thirdly, to wait a few minutes between each injection. The syringe used by the author is lined with tin, and is capable of containing two ounces of fluid; it is furnished with a long tubule, for the convenient insertion into the vein; a funnel communicates with the barrel of the syringe, through which the blood passes without being received into an intermediate vessel. It is seldom necessary to inject a large quantity of blood; it is better to discontinue the operation as soon as the rally is decisive, and there is no returning collapse. As a general rule, Dr. Waller says that from eight to twelve ounces may be safely transfused.

Another portion of the 'Transactions' is occupied by an important relation of cases of placenta prævia, by Dr. Robert Barnes, for which practitioners of midwifery, especially in rural districts, will be much obliged to him. For the sake of all such, we would fain give a full analysis of what this paper contains; but in order to do this we should be compelled almost to transcribe it, and we would rather recommend the attentive perusal of the paper itself, than run the risk of lessening its value by omitting any important point it contains. The management of cases of placenta prævia is one of the most important subjects in midwifery; they are fortunately not very frequent in any individual practice; but this very fact, and their extreme urgency when they do occur, render it most important for rules of practice, such as may be depended upon, to be laid down clearly, distinctly, and with that weight of authority which nothing but accumulated experience can afford. There is one point in the conclusions offered by Dr. Barnes with respect to this subject on which we feel somewhat doubtful. No practical man now questions the fact that separating the placenta from its attachments will put an end to hæmorrhage in cases of placenta prævia; but we doubt whether "the artificial detachment of *that portion of the placenta which adheres within the cervical zone of the uterus*," will in the generality of cases succeed. We believe that in partial separation of the placenta, *the hæmorrhage comes from the placenta itself;* and that nothing short of its *entire* separation from the uterine surface, and thus cutting off all further supply from the mother, can be safely depended upon for putting a stop to the loss of blood.

Dr. R. Uvedale West relates a case of fatal puerperal peritonitis, and adds a table of cases of fever during the puerperal state, which we think strongly exemplifies the contagious nature of puerperal fever, and the extreme care required to prevent communicating the disease from one patient to another. The success of the treatment of these cases is satisfactory, but the nature of it is very imperfectly described in the table. Little more is said than that the treatment consisted of "opiates, aperients, with fomentations." Of what did these consist? In the description of the only case given at length, we find that turpentine stupes were applied to the abdomen, and that turpentine enemata were on several occasions administered; did the fomentations used in the other cases contain turpentine, or was it employed in any way to obtain relief from the bowels? These are questions of importance now it is believed by many practitioners that turpentine is valuable, if not essential, in the treatment of puerperal fever.

Dr. Clay, of Manchester, relates a case, the peculiarities of which are the supervention of pregnancy on extensive ovarian disease, and the rupturing of the ovarian sac spontaneously, either into the left ureter, or directly into the bladder. He remarks:

> "So favourable a result to such a rupture could scarcely be expected, as it appears almost impossible a rupture should occur in either place without involving serious mischief in the peritoneal cavity. Since 1842, I have diagnosed nearly 2000 cases of ovarian disease, and have extirpated 93 ovarian tumours; but in the whole of that experience I have only seen two cases of pregnancy coexistent with extensive ovarian disease."

Dr. Rigby has contributed two cases of cranial blood-swelling. We are familiar with cases of this description; they are often sources of anxiety to mothers, and require to be understood by accoucheurs, lest errors of treatment be committed. We believe they are perfectly free from danger, and, *if let alone*, sure to subside and disappear.

Dr. Graily Hewitt's paper on the Hydatidiform Mole forms one of the many interesting papers contained in the volume. The author's object is to prove that the so-called hydatids which are expelled from the uterus are the result of changes in the chorion villi, and are secondary to, and a consequence, not a cause, of the death of the embryo; that in the hydatidiform mole we have not a new formation, but simply an alteration and degeneration of previously existing structures arrested in their development, this arrest of development taking place simultaneously with the death of the embryo. Dr. G. Hewitt does not deny the possibility of an expulsion of true hydatids from the uterine cavity, but says that when so expelled, they originate in the substance of the uterus, and subsequently burst into the cavity of that organ. How are these to be distinguished from the degenerated and enlarged chorion vesicles? Dr. Hewitt says:

> "A careful examination of the bodies expelled, by the naked eye and by the aid of the microscope, should be sufficient in every case to set the matter completely at rest. In the case of true hydatids, we find cysts enclosed one within the other; in the case of hydatidiform vesicles, we find round or oval bladder-like bodies attached one to the other, somewhat after the manner of a string of beads, with slender peduncles or intervening portions. Moreover, the well-known hooklets of the hydatids are usually found when the cysts are really of hydatid origin."

We recommend those who have the opportunity to test the value of the above opinions and suggestions, by carefully perusing the paper, and comparing the conclusions contained therein with their own practical investigations.

Other interesting subjects are illustrated in the volume before us, amongst which we would refer our readers to two statistical reports by

Mr. R. Dunn and Mr. Bailey, of Thetford. We have already been induced to prolong our notice of this book to an unusual extent, and must now refer our professional brethren to the work itself, from which much additional information is to be derived. It is a thoroughly *practical* work, and shows the usefulness of the Obstetrical Society in such a strong light, that we imagine few who read it will fail to avail themselves of the benefits which such an association must unavoidably confer upon those belonging to it. Although not in all respects perfect, this volume of Transactions is a work which reflects great credit both upon its contributors and compilers; and, contrasted with many publications of the present day, we must acknowledge that we rise from its perusal with a high sense of its practical value in reference to a very important branch of our profession, and an earnest desire that a work so well begun should not only continue, but yearly increase in usefulness, as a means of accumulating a fund of valuable practical information.

Review VIII.

1. *The Medical Knowledge of Shakespeare.* By John Charles Bucknill, M.D. Lond., Fellow of the Royal College of Physicians, Fellow of University College, London, Superintendent of the Devon County Lunatic Asylum, Editor of the 'Journal of Mental Science,' &c.—*London*, 1860. pp. 292.
2. *The Psychology of Shakespeare.* By the same Author.—*London*, 1859. pp. 264.

Shakespeare-criticism, apart from the ordinary investigations into the philosophy, history, antiquities, and language of the dramas, has lately afforded employment to the learned leisure of professional men. These have undertaken to expound to the general reader the special points in their own callings on which the poet excelled. If the professional man who undertakes the task of commenting on Shakespeare has an intelligent respect for and a comprehensive knowledge of his author, there can be no objection to the disproportionate prominence that his researches will give to one side of the poet's character. It is only when, seduced by class-feeling, or the temptation of theorizing, the commentator deduces narrow conclusions as to the poet's life, education, and mental capacity, that the investigation becomes offensive from its one-sidedness.

The reader of a criticism on Shakespeare by a doctor of whatever faculty, must always remember that in the sixteenth century the body of human arts and sciences was of a magnitude that might be submitted to a single man with infinitely more chance of his mastering it than now-a-days. Division of labour was less strict. Minutiæ, even such as now constitute the technicalities of various trades and professions, were in those days negotiable terms of thought between instructed people of every occupation. And when it is considered that our great dramatist possessed to a degree that has never been equalled the faculty of seizing and assimilating every subject of knowledge, and the power of reproducing with most marvellous exactness the features of the living drama that all the world was playing before him, it is clear that in his works, most of all, should we expect to encounter expressions and turns of thought that we now regard as the peculiar property of a special calling. The function of the commentator who studies the poet from a professional point of view is distinct, and is expressed in Dr. Bucknill's conviction, "that the knowledge of the great dramatist is in every department so extensive and exact, that it requires the skilled observation of a professional mind fully and fairly to appreciate and set it forth."

To such a task, however, very different qualifications have been brought. With his special insight into human frailty and Divine beneficence, what illustrations should the clerical commentator find in these dramas of the perplexing problems that ever exercise the spiritual faculties of man? How technical, even, was the poet's religious knowledge, has been recently indicated by a lay critic on the *Merchant of Venice*, where a multitude of nice particulars distinguishing the Judaic and the Christian codes are demonstrated which would certainly escape most of even careful readers. Yet when a clergyman, turning from Ecclesiastes, sets himself to gauge 'The Mind of Shakespeare as exhibited in his Works,' he produces nothing better than "upwards of five hundred sentiments, ideas, aphorisms, and doctrines, capable of being made available for the edification of the world," and "untramelled by dramatic appendage." According to this writer's estimate, nothing but the perverse necessity of earning his bread "constrained and imprisoned" Shakespeare's talents to the composition of plays. What has not the world lost in "Sermons, doctrinal and practical, by the Rev. W. S.," through the accident of John Shakespeare's poverty!

A member of the legal profession, Mr. Rushton, followed by no less a personage than Lord Campbell, the then Lord Chief Justice, have lately given the world their estimate of England's poet from the special point of view and with the special bias furnished by their own education. They have indeed, the former writer especially (who is judiciously content to put much knowledge in a very little pamphlet), collected a good number of instances of the technical use of law terms and of legal methods of thought that enable the general reader to appreciate many passages previously obscure. But these learned commentators have had another and more definite object. In Shakespeare's works they have set themselves to discover evidence that he was a professional lawyer, and thus they strive to confirm the supposition of Chalmers and Malone, that his youth before his settlement in London was passed in an attorney's office. In this attempt, the legal critics have obtained only an amount of success at which the more distinguished lawyer, resuming the judge, merely laughs when he is challenged to pronounce for the opinions advanced by him as advocate. From the whole of Shakespeare's works ransacked by two able lawyers for the purpose, such a knowledge only of legal technicalities is demonstrated as must needs have been in the possession of a man of business, occupying himself, as Shakespeare did, with social questions around him. Scanty as is the extrinsic evidence in support of the theory, still more frail is the basis on which it is attempted to prove from his writings "Shakespeare a lawyer."

The author of the volumes before us has, in the main, avoided the errors of the clerical and legal critics whom we have cited. With an enlarged and scholarly mind, and with a deep reverence for the poet, Dr. Bucknill was not likely to commit the Rev. Mr. Morgan's blunder of producing five hundred mutilated bricks as representing the intellectual edifice erected by Shakespeare's genius. More tempting to him was the example of the lawyers. He might have been excused if his own sense of the worth and tendency of his profession had led him to believe no other education capable of evoking Shakespeare's sensibility of mind, his appreciation of character, and his power of observation. A theory that Shakespeare's youth, at the obscure period of his apprenticeship to the Muse, had been passed among the scenes of suffering and joy, in the alternations of pathos and humour to which scarce any but the physician is admitted, might have been at any rate as worthily sustained as the hypothesis which makes him to have learnt his mastery of the human mind over the "trade of Noverint" on a Stratford attorney's stool. But Dr. Bucknill "desires explicitly to disavow the intention to put forward on behalf of his own profession any claim for the honour of having occupied the unaccounted-for period of Shakespeare's early manhood." He addresses himself to elucidating the dramas by his own profound knowledge of physiology and mental pathology, and by research into the history of medicine so far as it may illustrate his author.

Properly speaking, however, 'Shakespeare's Medical Knowledge' would be the right title for both Dr. Bucknill's works taken together. In the 'Psychological Essays'—the word psychology being defined by the author as synonymous with mental pathology—the chief characters of the dramas are analysed, with the result of proving an exactness and depth of insight into the causes and phenomena of every phase of mental disorder, such as no writer but Shakespeare has ever achieved, and such as none but a learned and observant physician with a special training is qualified to detect. Such was surely Shakespeare's medical knowledge. Such, from the nature of the case, is almost the only medical knowledge that can occupy the dramatist. Bodily ailments and injuries may indeed be casually referred to, but mental peculiarities and diseases are the department of the physician from which the plots of whole scenes, or even of whole dramas, must constantly be contrived. Besides minor difficulties into which Dr. Bucknill has been led by this unnatural partition of his subject, there is a primary unfairness, both to himself and his author, in setting forward as "Shakespeare's medical knowledge" only the proofs of his more technical acquaintance with anatomy, pharmacy, and bodily ailments. Such knowledge as this was possessed to at least an equal degree by Ben Jonson. The physician in Sejanus uses more terms of his art than would be found in a dozen plays of Shakespeare. Lovel's microscopical anatomy, Wittipol's cosmetic, and Subtle's alchemical pharmacy, the pathology of Dr. Rut, and Dr. Almanac's cant of dissection and astrology, might be set against any of the evidence of "Shakespeare's medical knowledge" produced in Dr. Bucknill's book with that title. But if no one will be found to contend that Jonson's knowledge of medicine approaches to that of Shakespeare, it is because Shakespeare's claim rests on far higher grounds than on an acquaintance with the medical artists of his day and the employment of their phraseology. Shakespeare is a physician, indeed, on that very evidence which in Dr. Bucknill's books is dissociated from his "medical knowledge" under the name of his psychology.

Dr. Bucknill's 'Psychology' has before formed the subject of a notice in this review. Of it, it will here be sufficient to say that no commentary on Shakespeare has added more conspicuously than this volume to our right understanding of the complex creations of the poet, or has enabled us more deeply to penetrate into the mystery of what manner of man Shakespeare himself must have been. To the student of medicine who desires to lay a foundation for research into mental pathology, there could be given no more profitable, as well as no more delightful task, than to study again the plays of Shakespeare, with Dr. Bucknill for his tutor.

Dr. Bucknill's second work derives most of its value from the care with which its author has thrown himself into the state of medical science and polity in Shakespeare's time. In the absence of any synopsis of the medical belief of the sixteenth century, original authorities have been consulted—

"The medical works of that age have been studied, it is hoped with sufficient success to enable the medical passages of the dramatist to be brought to the test of a fair comparison with the opinions of his professional contemporaries. Perhaps it may be permitted so far to anticipate the proofs as to state that this research has been rewarded by establishing the fact that Shakespeare's theoretical knowledge of medicine closely corresponded to that prevailing at his time among its professors, and that he had authority even for his trivialities and most glaring absurdities. Who would have thought that when he says that toothache is owing to a humour or a worm, he had the authority of John of Gadisden for the opinion? Who would have thought when he describes Queen Mab's charioteer as

"'Not half so big as a round little worm
Pricked from the lazy finger of a maid,'

that the curious statement was supported by the authority of an eminent contemporary surgeon?"

With the old poets, we all relish the ridiculous side of certain of man's functions, but Dr. Bucknill can get us instruction as well as amusement from this form of jest. Uromancy is a less obtrusive science, though scarcely a less important one, in our own day.

"'These follies are within you, and *shine through you like the water in an urinal, that not an eye that sees you but is a physician to comment on your malady.'—Two Gentlemen of Verona,* Act ii., Scene 1.

"The singular pretence to which these passages refer, of recognising diseases by the mere inspection of the urine, is alleged to have arisen, like the barber surgery, from the ecclesiastical interdicts upon the medical vocations of the clergy; priests and monks being unable to visit their former patients, are said first to have resorted to the expedient of divining the malady and directing the treatment upon simple inspection of the urine. However this may be, the practice is of very ancient date. Richardus Anglicus, the earliest of English physicians, who flourished about the year 1230, left two works on the subject, 'A Tractate of Urines,' and a work 'On the Rules of Urines.' The uncertain and pretentious nature of medical opinions founded upon this basis was also recognised in early times. Thus, Fuller, speaking of Robert Recorde, a physician of Oxford, 1550, whose 'soul did not live in the lane of a single science, but traversed the latitude of learning,' says that he wrote 'Of the Judgments of Urines;' and though it be commonly said *urina meretrix*, yet his judicious rules have reduced that harlot to honesty, and in a great measure fixed the uncertainty thereof.'

"We learn from Dr. Harris' 'Pharmacologia Anti-Empirica,' 1683, that the illustrious founder of the College of Physicians set his face against this quackery then so much in vogue. . . . . .

"The same author refers to an old statute of the College itself, in which water-casting was denounced as belonging to tricksters and impostors, and any member of the College was forbidden to give advice upon the mere inspection of the urine without he also saw the patient."

Discussed with equal skill and erudition, the reader will find curious scraps of information as to the status of the several branches of the medical profession, the profits of the physician, and the furniture of the apothecary's shop. He will gather some of the views that were held in Queen Elizabeth's time on the infectiousness of diseases, the tokens of plague and fever, the consequences of the "rotten diseases of the south," and their treatment by diet, bathing, and mercurial fumigations. There is, too, much able criticism on obscure passages where the physiology of the period enters into the question. Here is an instance where the physician notably aids the scholar:

"'And thus I cured him; and this way will I take upon me to *wash your liver as clean as a sound sheep's heart, that there shall not be one spot of love in't.*'—*As You like It*, Act iii., Scene 2.

"In this last passage, surely the words heart and liver should be transposed, since the text is evidently an inversion of the true meaning. Love is generally said to dwell in the heart, while, on the other hand, unsound sheep are not known by the condition of this organ, but by that of the liver, the well-known peculiarity of sheep disease being flukes or hydatids of the liver, which give that organ the spotted appearance to which Rosalind refers."

For other such examples we may refer to the commentary on Petruchio's horse, on Doll Tearsheet's "powdering tub of infamy," or to the following account of a passage not at first easy to be apprehended:

"When Imogen strives not to permit her sickness to engross attention, her excuse conveys a reproach on the fancied illnesses of those on whom the influences of city life have conferred the curse of hypochondria.

"'So sick I am not;—yet I am not well:
But not so citizen a wanton, as
To seem to die, ere sick."

Cymbeline. Act iv., Scene ii.

Phenomena relating to the blood and its motion are so frequently referred to by Shakespeare, that, after several comments, Dr. Bucknill at last produces the whole pre-Harveian theory. It will be found in illustration of Falstaff's commendation of Sherris. We fear that before Dr. Bucknill had mastered this ancient theory for himself, he had already sent the MS. of page 74 to the press. There is another instance of a correction in the later sheets of a statement in the earlier, which we refer to, to suggest that the correction is wrong.

> "A perusal of Astruc's learned work instructs me, that I have probably been wrong in the opinion expressed in an earlier page, that the French crown referred to in *Measure for Measure*, *All's Well that Ends Well*, and *Midsummer Night's Dream*, was the common venereal *rupia*, since it appears that there was a particular form of venereal skin disease which was called '*le chapelet*,' a technical term which would be anglicised into 'crown.' 'The skin,' says Astruc, 'is troubled with hard, callous, circular tubercles or pustules. They are frequently to be found, too, about the forehead and temples, and behind the ears, where, being disposed in order, they form the figure of a crown, and are commonly called by the French *le chapelet*.'" (p. 258.)

The evidence at page 72, derived from a note in the Oxford quarto of 1744, is by itself as good in favour of the "French crown" being syphilitic *rupia;* but this interpretation seems to be rendered positive by the occurrence—in Bartholomew Fair, for instance—of the phrase "crown-*scab*" to represent this venereal eruption.

These contradictions are not the only sign of hasty bookmaking in the volume. At least one-third of it would have been sacrificed in manuscript, if Dr. Bucknill had taken labour to be brief. No attempt has been made to classify the passages which evidence the poet's medical knowledge, and the result is a very needless dwelling on trivial particulars. Over and over again the mention of blood, of a pestilence, of a surfeit, provokes a quotation and the repetition of a commentary.

Again, the instances are not few where the dramatist is credited with more than he can fairly be made to answer for. Thus, the commentary on the passage—"Sickness is catching; O, were favour so;" that "the general contagiousness of disease was a prevalent opinion in the old time," is as if one should deduce from Hamlet's metaphor the conclusion that the porcupine is an exceedingly ill-tempered animal. The statement of the commentary is itself an error; many diseases were never supposed contagious, and even among fevers we have proof that a contemporary dramatist knew "that hectics are not epidemical." We doubt, too, if the gradual cure of wounds, "as by granulation," was much in Iago's mind in the lines:

> "How poor are they that have no patience!
> What wound did ever heal but by degrees?"

Nor is King Claudius's simile—

> "For like the hectic in my blood he rages,"

fairly chargeable with the gloss, "the word hectic is peculiarly appropriate here, as a chronic fever produced by iritation." And Shakespeare would probably be surprised to find that he had thought out all that follows, when he used the very common metaphor of choler for anger:

"'Speak, Winchester; for boiling choler chokes
The hollow passage of my prison'd voice.'

"The adaptation of the old theories to the pathology of the passions was necessarily difficult. The liver was thought the seat of passion, and superfluity of choler the result of its excitement, and the nerve-symptoms arose from the boiling choler." (p. 172.) In the following stanza Dr. Bucknill finds, "curiously enough," a foreshadowing of the Ammonia-theory of coagulation:

"'About the mourning and congealed face
Of that black blood, a watery rigol goes,
Which seems to weep upon the tainted place:
And ever since, as pitying Lucrece' woes,
Corrupted blood some watery token shows;
And blood untainted still doth red abide,
Blushing at that which is so putrefied.'"

Dr. Bucknill, however, does not discover that—

"Advice is sporting while infection breeds"

has reference to the Metropolitan Board of Works and the Main Drainage of London.

On the other hand, the description of Cæsar's fever to which Abernethy used to direct his students as the most perfect picture of an ague fit, appears to Dr. Bucknill meagre and indefinite, though he takes occasion to repeat every line of it in a prose periphrasis. Shylock's neat physiological illustration, again, is passed over without a note, though it must be nigh unintelligible to the general reader—

"And others, when the bagpipe sings i' the nose
Cannot contain their urine;"

To "the insane root that takes the reason prisoner," it can hardly be said that we have no clue, especially if it produces the symptoms that Shakespeare is supposed to have read of in Plutarch. Can it be anything but some one of the belladonna tribe?

The majority of the faults that we detect in Dr. Bucknill's book appear to be traceable to the primary oversight to which we have adverted. The title of the book, and the dedication of it to Lord Campbell, have seduced the author into a sort of imitation and rivalry of 'Shakespeare's Legal Acquirements considered.' In one sense this rivalry is not to be regretted, as it has resulted in the conclusive defeat of any claim for speciality in Shakespeare's law knowledge. On the other hand, it has misled Dr. Bucknill into diluting injudiciously a most useful chapter of Shakespeare's medical knowledge. We trust that in a subsequent issue he will consider more seriously the "inconveniences of a separate publication," and by omissions and better classification earn an easier recognition of his really valuable labour.

REVIEW IX.

1. *Mind and Brain: or, the Correlations of Consciousness and Organization; with their Applications to Philosophy, Zoology, Physiology, Mental Pathology, and the Practice of Medicine.* By THOMAS LAYCOCK, M.D., &c. &c., Professor of the Practice of Medicine, &c., in the University of Edinburgh. Two vols.—*Edinburgh.* 8vo, pp. 920.
2. *On Obscure Diseases of the Brain, and Disorders of the Mind: their Incipient Symptoms, Pathology, Diagnosis, Treatment, and Prophylaxis.* By FORBES WINSLOW, M.D., D.C.L., &c. &c.—*London.* 8vo, pp. 744.

THE conflicting and unsatisfactory results of abstract speculations on the constitution and powers of the human mind, have long been a source of regret and discouragement; every attempt, therefore, which is in any degree judicious, to place mental philosophy on a surer basis than that on which it has hitherto rested, is to be entertained with candour, and, in so far as it may conduce to the desired end, to be accepted with thankfulness. Such an attempt has been made by Dr. Laycock, and not without success, in the work which stands first in the heading of the present article.

The failure which has hitherto attended such inquiries is attributed by Dr. Laycock to a variety of causes, among the chief of which may be mentioned the disjunction of mental philosophy from physiology, and the study of disease—the neglect of comparative psychology—the fact that the conclusions of metaphysicians have not been sufficiently tested by the general experience of mankind—and the influence of prejudices derived from speculative theology, and a supposed antagonism between revelation and science. His perception of these sources of error, and of the most likely means of obviating them, give a considerable value to his work, notwithstanding an essential faultiness in his method, and the introduction of a great many speculative views, which, we think, had far better have been omitted.

Anticipating, from the title, a work of a much more practical character, we were disappointed to find that a theory lay at the root of the whole matter. This theory is a sort of combination of the philosophy of Plato with the physiology of Stahl.* Dr. Laycock attributes not only the activities of mind, but those of life also, to "an immanent inherent energy, ever operative, which is not a mere physical or material agent, and which can only be conceived as an actually adapting force, manifested in the phenomena of life" (vol. i. p. 2). This "energy," "mind," or "soul,"† is not, however, in itself, endowed with consciousness, which is developed only through the functions of the brain, but is, as it were, the unconscious vehicle of certain "archetypal" or "teleiotic" ideas, derived from the Divine mind, and carried into effect in the vital organs and functions.

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* Dr. Laycock regards Stahl's hypothesis of a common cause of mind and life, as a revival of that of Aristotle. But there was this great difference between them—that Aristotle, while he ascribed the nutritive, sensitive, appetitive, and motory functions to a kind of soul common to man, animals, and plants, regarded the thinking faculty as appertaining to another kind of soul, capable of separate and independent existence.

† Dr. Laycock, at different times, applies all these terms to what he regards as the

Now, Dr. Laycock's theory may, perhaps, be as good as any other. But any theory accepted as a basis of scientific investigation, is decidedly objectionable on the ground that facts which will not conform to it are extremely apt to be overlooked, or unfairly dealt with, even where there is no intentional want of candour on the part of the theorist. It would not, we think, be difficult to point out several instances in which our author has been led, by his theory, to overlook or ignore subjects worthy of attention; but we will confine ourselves to one—namely, the possibility of a communication between departed spirits and men still living in the body. There is a great mass of alleged facts bearing on this point, which in times past were universally accepted by popular superstition, and pretty extensively even by learned credulity, but which were contemptuously dismissed by the philosophic scepticism of the last century. In the present day, there is a strong disposition in many quarters to subject them to a rigid and impartial scrutiny. This is the only fair and philosophical procedure with regard to them, and on the result of such scrutiny they must stand or fall. Dr. Laycock, however, comes to a summary decision, asserting, as to the possibility alluded to, that "as a speculative proposition it is useless even if true," while "it is practically pronounced by the enlightened experience of mankind to be false" (vol. i. p. 100). We differ from him both as to the value of the proposition if true, and as to the sufficiency of the ground on which he declares it false. If true, so far from being useless, it would at once solve, in the affirmative, the important problem of the immortality of the soul, and would, moreover, disprove the *necessary* dependence of consciousness and thought on cerebral action. Again, we cannot yield much deference to so vague an authority as that of "the enlightened experience of mankind." There is, doubtless, a common experience of mankind relating to ordinary matters, which must be held as authoritative, and from which no appeal can be allowed, because men of all ages and nations have been so unanimous therein, that if any individual oppose his own peculiar convictions to such experience we at once pronounce him perverse or insane; but this certainly entirely ceases when there are diversities in the experience, and we are called upon to decide

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common cause of life and mind. It seems to us that there can be no clear reasoning on the subject of mind, while the term "mind" is used, as it continually is, by writers, in two different acceptations. It is used sometimes to designate the aggregate phenomena of thought and feeling, and at others to designate a something different from the body—whether separable from it or not—which is the cause of those phenomena. In the latter sense it seems synonymous with *soul*. Now we think that the term "mind," and its corresponding adjective "mental," should be restricted to the phenomena, and the term "soul," to the supposed cause alluded to. Of course, the materialist will have nothing to do with *soul;* but with him the terms "mind" and "mental" will still apply to the phenomena of thought, though he regards these merely as functions of the *brain*. We are convinced that the limitation of terms here proposed would prevent a good many logomachies.

which is the enlightened portion of it; for then each of the conflicting parties will claim all the enlightenment for their own side of the question. We beg not to be understood as coming forward in the capacity of apologists for "the ghosts," in which all our habitual modes of thinking incline us to disbelieve; but we are, nevertheless, advocates for impartial investigation, and would not have this, or any other subject of inquiry, hastily cast aside. on the presumption of an *à priori* absurdity or impossibility in the alleged facts.

In our opinion, by far the most important positions in Dr. Laycock's work, are those relating to the nature of consciousness, to the connexion between the cerebral functions and the manifestations of mind, and to the instinctive character of the mental faculties. In reference to the first, Dr. Laycock observes that—

> "The fundamental principle that existence in the order of events precedes thought, having been overlooked by the great majority of philosophers since the time of Descartes, they have commenced the investigation of the laws of thought independently of the laws of life or existence. Hence the doctrines of consciousness are founded primarily upon inquiries into how the man feels and knows, without reference to how he exists; in other words, an 'immaterial' *ego* has been accepted as the proper subject of inquiry, rather than the 'concrete' *ego*." (Vol. i. pp. 133-4.)

He goes on to argue, that the consciousness of unity or personality depends on the correlation of life and mind; that every man knows that he exists continuously, as one and the same, in health and in disease, in infancy, childhood, youth, manhood, and old age; that in no two of these, and numerous other states and conditions, is he exactly the same; yet that, with this incessant change, he is one and the same person throughout.

All this, we conceive, is perfectly correct, with the exception that, when Dr. Laycock speaks of "the laws of life *or* existence," he is taking for granted that there can be no existence independently of life, which, though part of his theory, is by no means necessarily true.

On the second point—the intimate connexion of the phenomena of mind with the functions of the brain—there cannot be two opinions among those acquainted with the facts of physiology. The only question is as to their necessary and inseparable connexion—a question which Dr. Laycock settles too peremptorily in the affirmative.

With regard to the third point—the instinctive, or innate character of the mental faculties—there can be no doubt that physiological observation has long been tending towards the conclusion that the phenomena of mind in man and the inferior animals differ not in kind but in degree, and that it is impossible to draw any distinct line of demarcation between what is called "mind," and what is called "instinct."

On the whole, we believe that the three following propositions will scarcely be disputed by any sound physiologist, or by any metaphysician who has a competent knowledge of physiology:—

1. That in our present state of existence, consciousness is exercised in connexion with combined mental and corporeal conditions and

actions; consequently, that the question whether or not it may exist in a thinking principle distinct from the body, is one for the metaphysician merely; while the subject of inquiry for the practical psychologist is the consciousness of the living and concrete man, with whom he is alone brought in contact.

2. That the phenomena of mind, in our present state of existence, are so intimately connected with those of life, and especially with the functions of the brain, that they can only be practically or profitably studied in close connexion with them.

3. That there is at least a strong probability that the mental powers of man and of the inferior animals are of a similar nature; that they are of an innate or instinctive character in both, and that, consequently, the study of comparative psychology may be found to stand in nearly the same important relation to mental philosophy that comparative does to human physiology.

It appears to us that, in adopting these propositions, we are going as far with Dr. Laycock as is necessary to an investigation of the subject of "Mind and Brain," according to all that is really practical in the method of inquiry which he advocates; and if we decline to accept his hypothesis of the identity of life and mind, it is because it explains nothing that may not be as well explained without it, while it excludes possible facts that might be incompatible with it.

With respect to what may be called the "Platonic" portion of Dr. Laycock's views, the "archetypal ideas" must be admitted to exist somewhere, or they would not be realized in creation; but, if we suppose them to remain in the infinite and self-conscious intelligence, rather than to be delegated to a finite and unconscious thing, such as Dr. Laycock imagines the soul to be, we are merely availing ourselves of the liberty conceded in the sound *dictum* of Samuel Johnson, that "on the arena of conjecture all men stand equal who are equally well informed." In connexion with this part of the subject, we may remark that it is not needful to have recourse to any derivative or secondary mind to account for the phenomena manifesting design in the living body. The phenomena of the inorganic universe are equally indicative of design; yet no one now-a-days imagines that there is any secondary mind, or *anima mundi*, lurking under them. It is believed simply that the wisdom of the Deity, working through the laws and properties of ordinary matter, accomplishes certain ends; and if so, why may not the same wisdom, working through the laws and properties of living matter, accomplish the ends necessary to the organism? It seems singular that Dr. Laycock should have thought it needful to resort to a derivative mind to carry out the Divine ideas in the living body, while he does not put in requisition any similar mind to carry out the ideas in the inorganic universe.

In asserting the inseparable connexion of the science of mind with the physiology of the brain, Dr. Laycock does not undervalue the importance of logic and metaphysics.

> "There can be no observation without thought about the thing observed, and no right or useful thought without that discipline of the mind which a

knowledge of true logic and metaphysics implies. Undoubtedly they have been either wholly neglected, or treated as of secondary importance by many modern inquirers; but it will be found on examination, that these persons have fallen into errors which the knowledge they despised would have enabled them to avoid, or have been less successful than they otherwise would have been, or from a natural defect in the constitution of their minds, have not been able to perceive the true uses and applications of logic and metaphysics in inductive research." (Vol. i. pp. 4–5.)

It may be added, that whatever view we take of the causes of mental phenomena, the phenomena themselves are essentially abstract. Ideas can neither be compared by geometry, nor analysed by chemistry; yet they are susceptible both of comparison and analysis; but these are to be effected by processes of reasoning, in the use of which accuracy is only to be attained by appropriate method and frequent exercise. The great error of metaphysicians has consisted in applying abstract reasoning not only to the products of mental operations, but to the operations themselves, without considering how far material organization and vital action might be concerned in them.

With these general strictures, which may obviate the necessity of frequent repetition, we proceed to such brief notice of the several divisions of Dr. Laycock's work as our limits will allow.

The subject is distributed into six parts, of which the first embraces a "Preliminary Dissertation on Method;" the second, "Metaphysics;" the third, "Mental Dynamics," or "Teleology;" the fourth, "Principles of a Scientific Psychology;" the fifth, "Principles of a Mental Physiology;" and the sixth, "Principles of Mental Organology."

PART I.—THE METHOD OF STUDY.—We can here only find space for Dr. Laycock's "Summary of the Method," which is as follows:

"If, then, we consider the preceding doctrines with a view to a practical development of our proposed method, we shall find that there are three stages or steps by which it may be carried into effect. First, we shall have to inquire into the general and scientific experience of mankind as to their states of consciousness (empirical psychology); next, we shall have to examine into the fundamental laws of existence (ontology); and thirdly, into the first principles of mind as an ordering force to ends (teleology, or mental dynamics). In the first, we examine consciousness in relation to vital phenomena; in the second, existence in relation to vital and physical phenomena; in the third, we develop the great correlations of mind with the physical and vital forces considered in relation to design in creation, viewed as a systematic unity, or the doctrine of ends. This will bring the highest manifestation of mind—as a creative and regulative power—into synthesis with creation, and consequently into synthesis with the human mind. Here the method will show that the ideas of the Divine mind, as revealed in the phenomena of creation, are none other than the fundamental ideas and *à priori* conceptions of the human mind as revealed in consciousness; that the ends aimed at and attained by the Creator, are the objects of the instinctive designs of the creature; and that, consequently, the phenomena of nature constitute a reflex of the human mind. Or, to use the words of M. Agassiz, 'the whole universe may be considered as a school, in which man is taught to know himself and his relations to his fellow-beings, as well as to the First Cause of all that exists.' In this way we shall have completed the task which we proposed at the outset—namely, to develop a method of philosophical inquiry which should combine the three great departments of human knowledge into unity, and attain to a knowledge of human nature, not empirically only, but deductively; through principles derived from the entire range of all science. Such principles being established, they can be applied derivatively to the development of each department of philosophical culture. In establishing these principles, I shall show their general applications to metaphysics, or a science of the fundamental laws of thought; to biology, and the entire group of natural history sciences; and to sociology; and then proceed to develop more especially the scientific basis of a mental physiology and organology, and their bearings upon medical psychology, and mental pathology. The whole will thus be a philosophical, scientific, and practical exposition of the fundamental laws of life and thought in their correlations. As such, it will constitute a solid basis upon which the metaphysician, moral philosopher, political economist, biologist, zoologist, and medical practitioner, can alike build up their respective departments; and at the same time be a starting-point for the man of general culture who wishes to study human nature under all its multifarious aspects." (Vol. i. pp. 113-15.)

The Doctor takes rather a wide range, and we think he does well to add to the foregoing, that such a field of inquiry "must necessarily be passed over cursorily," and that "errors, too, are inevitable from the very nature of the subjects considered."

Part II. Metaphysics.—These Dr. Laycock treats of under three divisions, embracing "The General Principles of Experience," "Empirical Psychology," and "Ontology." On the question, "What is the nature of matter, and what of mind?" our author appeals from philosophy to the experience of mankind. He observes that—

> "Experience gives what appears to be a simple solution. Matter is not mind, just as mind is not matter. Mind is therefore *im*material, and that which we cannot touch, handle, see, feel, and the like. On the contrary, matter is that which we *can* touch, handle, see, feel; and since we experience certain changes in our consciousness when we thus examine matter to which we give names, we connect those changes causally with the thing handled, touched, and the like, and we say they are due to the *qualities* of hardness, extension, weight, coldness, warmth, and the like—which names indicate changes in our consciousness. These causes of change we conclude to be inherent in the thing touched, inasmuch as without them we experience no sentient changes, and have no knowledge of matter, or of the thing we term material. Now, philosophers have raised many discussions upon these and other notions as to the nature, qualities, and properties of matter, which are to be found in works on philosophy and metaphysics; but mankind in general have had little difficulty in deciding what is mind and what is matter." (Vol. i. pp. 118-19.)

It appears to us, however, that Dr. Laycock's reasoning only goes to prove that neither philosophers nor mankind at large know anything about the nature either of mind or of matter. We know of mind that it is not matter, but that throws no light on what matter is; again, we know of matter that it is not mind, but that throws no light on what mind is; so that all we know of either amounts to a negation—that is to say, to no knowledge at all.

The division on "Empirical Psychology" treats of "Consciousness as the Ego;" "Consciousness as the Feelings and Sensations;" "Consciousness as Knowledge, Cognitional Consciousness;" "Successional Consciousness, or Thought;" and "Consciousness as Will, or Volitional Consciousness."

These subjects are in many respects ably handled; but, to our apprehension, the tendency of the whole is to disprove Dr. Laycock's own doctrine, that mind may be independent of consciousness; since all possible manifestations of mind are here represented as what they really are—so many different modes of consciousness.

This shows how necessary it is to keep in view the limitation of the term "mind," which we have proposed in the note to p. 406. If man has a soul (as we believe), it is obvious to common observation that this soul continues to exist during various states in which the consciousness of the concrete man is in abeyance; but if all the developments of *mind* consist in some modification of consciousness, to speak of "unconscious mind," or "unconscious mental action," is a mere contradiction in terms.

In the "Ontology," our author evidently mistakes unconscious cerebral actions for unconscious mental actions. There is no doubt that unconscious cerebral actions are continually taking place; but these, from the very fact of their being unconscious, are not mental in any ordinary or intelligible acceptation of the term. Perhaps Dr. Laycock may call them "mental," as supposing them to appertain to the mind, which he regards as the principle of life as well as of conscious existence, but which he alleges to be, in itself, unconscious. If so, he uses the term "mental" in a sense altogether peculiar, and which is admissible or requisite only on his own hypothesis.

The phrase "latent consciousness" also appears to us to be very objectionable. What do we mean by "consciousness?" Simply the *conscientia*—knowledge of, or privity to—certain states and actions occurring in ourselves. Its very nature excludes the notion of latency. The capacity of consciousness may exist, though the conditions of consciousness be not present; but consciousness itself is nothing, unless in activity.

The elucidation of unconscious cerebral action owes much to the labours of Dr. Laycock; but he has, in our opinion, failed altogether to perceive the most important application of the doctrine—namely, to show that certain phenomena which have sorely puzzled the psychologists, and given rise to various unmeaning terms, are not mental, but simply vital. It is curious that, in one passage of his work, he has actually stated this truth in an explicit manner, and has then immediately mystified it by a touch of theory. In Vol. i., p. 185, in reference to such phrases as "insensible perceptions," "perception without apperception," "latent consciousness," and "unconscious mental states," he says:—"All these terms are really applicable to *vital* sequences occurring in the organ of thought, without any consciousness or knowledge of them or their results on the part of the individual." This is the truth. But then comes the mystification: "Which sequences occur, however, according to mental laws as revealed to us by or in consciousness."

We are tempted to go into the subject of "mental latencies," in regard to which our author follows Sir W. Hamilton, but our space will not admit of it.

In the chapter on "Instinctive Existence," Dr. Laycock enters into a comparison between the mental constitution of man and of the inferior animals, and argues that—

> "The instinctive character of the mental faculties in man has been fully recognised by philosophers of all times; just as, conversely, the rational character of the mental faculties of lower animals has been recognised by the common sense of mankind." (Vol. i. p. 192.)

On the latter point it might, perhaps, be rather said that the rational character of the mental faculties of the lower animals is practically admitted by the manner in which men deal with these animals in their education and management; for, as a matter of opinion, we still find a great part of mankind regarding animals as if they had no reason, but were guided by "instinct," which is supposed to be different from reason, and to supply its place.

The greater part of our author's observations on this subject are accordant with observation and sound sense; but not so his conclusion that the mental phenomena in man are vital, because they are so in the lower animals. (Vol. i. p. 197.) That they are so essentially in either is a mere assumption.

PART III. MENTAL DYNAMICS, OR TELEOLOGY.—This is divided into: 1. "The Correlations of Causes, or First Principles of Etiology;" and 2. "Biology." The first treats in succession on the general doctrine of correlative causes, on the correlations of the vital forces, those of the physical and vital forces, and those of the physical, vital, and mental forces; and then gives "A General Formula of the Correlations of Life and Consciousness." We confess we never hear the word "correlation" without a feeling of uneasiness; so intimately is it associated in our mind with that transcendental tendency which seems to be pervading every department of science, and infecting even the results of observation and experiment with something of the vagueness and uncertainty of abstract speculation. That an important generalization may possibly issue from the attempts now making to reduce to a common law the various forces which operate on matter, we do not dispute; but we are fully convinced that this question should not at present be mixed up with any practical subject; otherwise, conclusions much more singular than valuable are, we think, likely to be arrived at. We do not see that this kind of inquiry can be brought to bear at all profitably on the study either of life or of mind; because, in respect to life, we know not how far its laws may be derivative from those of ordinary matter, or entirely different from them; and in respect to mind, we know not how far its phenomena may be due to vital agencies, and how far to a power the nature of which entirely eludes our research. We may therefore be excused from entering into the subjects discussed in these five chapters, in which, however, the reader who is partial to such speculations will find much that may be to his taste.

In the eighth chapter, on "Mind considered as the First Cause," Dr. Laycock argues in favour of the personality of the Deity. In such personality we believe; but our conviction is founded rather on religious than on philosophical data, and we cannot but think the inquiry foreign to the proper subject of the work before us.

We mentioned early in this article, that Dr. Laycock enumerates among the causes which have retarded the progress of psychology, a supposed antagonism between revelation and science, and as we have not found an opportunity of introducing the subject sooner, we may advert to it here. Our author mainly follows Dr. Whewell, in whose observations there is much both of truth and of eloquence. But we think that the matter is best placed on the simple basis that revelation has nothing at all to do with science; that the inspired writers were not commissioned to teach philosophy but religion; and that if they had propounded the doctrines which science now accepts, they would merely have been arraying popular prejudices against them, and thus raising unnecessary obstacles in their own path. We may add that, taking the relations in which revelation and science stand to each other in the present day, it appears to us as idle to object to Scripture that it does not afford a solution of scientific questions, as it would be to object to astronomy or geology that they do not point out the way of salvation.

On the second division of "Mental Dynamics"—that on biology—we need not dwell. It is very well as a piece of transcendental physiology, but has little that bears practically on the science of mind. The following, however, requires notice:

> "In the vital affinities of life and organization, we can discriminate between the force and the idea. Thus, when two cells come within the sphere of each other's action, two processes begin: *firstly*, disintegration (corresponding to decomposition in chemical processes), so that each cell ceases to be one by continuous dichotomy, and so disappears; *secondly*, integration, so that the two are formed into one. In this process it is a necessary condition to the series of changes that the two cells act upon each other. Nevertheless, there must be dynamical relations existing, antecedently but potentially, between the cells, such that the ends be attained. Now these dynamical relations are not accidental, but depend upon the causal antecedents of the two cells. The cells must be integrations of the multiform manifestations in time and space of an archetypal idea in a pre-existing individual; or in other words, must belong to the same species. There is thus a vital affinity between the two cells. When this is not present, as is the case when the generative cells of *different* species are brought into contact, there is no teleorganic change set up, and no sequences of phenomena begun." (Vol. i. p. 395.)

But sequences of phenomena do sometimes take place when the cells are of different species, and the question arises—What sort of archetypal idea inhabits the cell in such cases? For example, when a mule is engendered between a horse and an ass, is the archetypal idea that of a horse, an ass, or a mule?

PART IV. PRINCIPLES OF A SCIENTIFIC PSYCHOLOGY.—In this part Dr. Laycock deviates less than usual from the track of custom. It is a sufficiently instructive digest of the opinions of various writers, tinctured of course by his own peculiar views. There is not, we believe, anything in it to which we need specially refer.

PART V. PRINCIPLES OF A MENTAL PHYSIOLOGY.—In this the chapter which seems most worthy of attention is the second, containing an "Historical Review of Researches into the Law of Cerebral Differentiation with Unity of Function."

In the section on "The Physiognomical Method of Research," Dr. Laycock makes some interesting remarks on the faculty of the diagnosis of character by means of physiognomy which is possessed both by man and animals, and which he regards as instinctive. We have not space to transcribe the passage, which will be found in vol. ii. p. 157.

The subject of physiognomy leads to cranioscopy, and this to phrenology. On the last, Dr. Laycock somewhat characteristically remarks:

> "The phrenological school have had to carry on an incessant war in defence of their doctrines, but more especially of the physiognomical portion, which is the most vulnerable. I need only notice here the controversies which have arisen out of the doctrine of multiplicity of organs and diversity of function. These have originated in one fundamental defect—namely, the omission to recognise that law of unity in multiplicity, and of multiplicity in unity, which is the fundamental law of both mental and vital processes alike." (Vol. ii. p. 172.)

We apprehend, however, that the war which the phrenologists have had to wage, has been chiefly attributable to their own defective method of inquiry. Phrenology, as far as regards its susceptibility of proof, has one great advantage over all other systems in which mind is involved—namely, that it appeals directly to certain alleged facts; and if these facts be established, the doctrine follows as an inevitable consequence. Now, these alleged facts are, that the mental faculties and moral propensities of man and other animals depend on the development of certain portions of the encephalon, as indicated by the configuration of corresponding portions of the cranium. It seems extraordinary that a question at once so important to the interests of society, and apparently of such easy solution, should have remained for more than half a century in dispute, and be (as it would seem) no nearer a settlement now than it was at first. These very facts prove some radical defect in the method of observation. This defect we conceive to consist—1, in accepting a system of "organs," not one of which has received sufficient individual proof, and balancing these against one another to meet objections—a mode of demonstration which might appear to prove anything, and which therefore really proves nothing; 2, in overlooking the consideration, that as the greater number of persons exhibit nothing very striking, either in their mental characteristics or in the shape of their skulls, no sufficient test of the truth of any individual organ can be obtained from any but particular and strongly-marked cases, in which the quality and the organ are unmistakeably prominent or deficient. Let each of the organs be enabled to stand on its own ground, by a sufficient number of unequivocal observations; then, and not till then, may the different organs be legitimately brought to bear upon one another. This was, in fact, the method followed by Gall himself; and if his disciples had kept to it, we should ere this have had a practical solution of the phrenological question.

In Chapter IV. of this part, "Outlines of a Classification of Correlative Mental and Vital Phenomena," there is a section on the "Primordial Instincts; and first among these Dr. Laycock places—

> "*Dynamization*, or the acquisition and application of force to the continued existence in time and space of the individual and of the species. This includes the development and application of the mechanico-chemical forces, especially light, heat, electricity, and chemical affinity, to vital motion and teleorganic changes." (Vol. ii. p. 190.)

And he adds, in a note—

> "I have ventured to coin a word so as to denote this fundamental mode of vital energy; hitherto the law has not been formularized, and no term, therefore, has been invented to designate it."

We must confess, however, that we cannot here perceive any new law.

PART VI. "MENTAL ORGANOLOGY."—For what he includes under this term, and the limits within which he intends to pursue the subject, Dr. Laycock refers back to a passage in the Introduction to Part V. He there defines mental organology as "a doctrine of organization in relation to the varied states of consciousness which constitute in their totality the mental life of man." (Vol. ii. p. 140.)

This part contains less of the peculiar theoretical views of the author than any other part of the work. It is, in fact, a rather elaborate essay on the anatomy and physiology of the nervous centres. We have no particular remarks to make upon it.

There is an Appendix containing an "Examination of Dr. Carpenter's Claim of Priority as to the Discovery of the Law of Unconscious Cerebral Action." In this Dr. Laycock seems to accuse Dr. Carpenter of a wish to appropriate what does not belong to him. But the accusation is evidently quite unfounded. It seems, by Dr. Laycock's own showing, that the question of priority was amicably discussed between Dr. Carpenter and himself five years ago, and that it was agreed that Dr. Carpenter should, in the next edition of his 'Human Physiology,' acknowledge that not only the doctrine of reflex or unconscious cerebral action, but the applications of that doctrine to insanity, dreaming, somnambulism, hypnotism, electro-biology, reverie, &c., were due to Dr. Laycock; but that, no new edition of Dr. Carpenter's work having been yet called for, no such acknowledgment has yet been made. Surely Dr. Laycock has nothing to complain of in all this; and we have no doubt that Dr. Carpenter, when the next edition of his work does appear, will fulfil whatever he may have promised. But it would not be just to omit remarking, that if Dr. Carpenter yielded to Dr. Laycock the priority in respect to unconscious cerebral action, he must have been induced by feelings of politeness to yield more than he was strictly called upon to do; for it certainly was not, in the first instance, either plainly expressed by Dr. Laycock, or generally understood by physiologists, that his "reflex action of the brain" was unattended with consciousness. Neither Sir H. Holland, Dr. Symonds, Dr. Noble, nor Mr. Dunn regarded the matter in this light; as, indeed, how should they, when Dr. Laycock's illustrations were all drawn from instances in which consciousness was obviously involved?

It will be observed that we have not attempted any critical analysis of the entire contents of Dr. Laycock's work. We have avoided such attempt—first, because we should have required a space equal, at least, to that occupied by one entire number of this Journal; secondly, because there are considerable portions of the work which, if divested of the obscurity which too speculative reasoning and a peculiar phraseology have thrown around them, would be found not to contain anything very extraordinary.

This is a most unequal work, exhibiting both great merits and great defects. Among its merits may be mentioned extreme ingenuity; extensive and accurate information on a great variety of subjects; and, above all, the distinct indication of certain paths of inquiry which decidedly lead in the right direction. Among its defects, the principal are, that which we have fully commented on, of assuming a mere theory as a basis of inquiry; that of attempting to embrace far more than any one mind, however gifted, could possibly deal with; and, lastly, a great want of close reasoning and of simplicity of language, so that all that is valuable in the work might have been set forth more clearly in half the compass. The author states in his preface, that the work is primarily intended as a class-book for students. To this end, however, it is in no way adapted; the advanced psychologist alone could either appreciate its excellences or detect its fallacies.

With all its faults, Dr. Laycock's work must be considered as a remarkable and valuable contribution to psychology, and as claiming a place in the library of every philosophical physician.

We now turn to Dr. Winslow's volume. He tells us in his preface, that it was originally intended as an introductory chapter to a treatise which he has in preparation, 'On Softening, and other Types of Organic Disease of the Brain.' The length, however, to which the prefatory essay extended, determined him to enlarge it still further, and to publish it in a separate form. The author commences by pointing out the importance of attending to the premonitory symptoms of cerebral disease, and shows how great and general is the neglect of the subject. The cause of this neglect he ascribes to "a notion too commonly entertained, that many fatal cerebral diseases are *suddenly*-developed affections, presenting no evidence of antecedent encephalic organic change, and unaccompanied by a premonitory stage or incipient symptoms" (p. 4). He refers to the numerous cases in which fatal attacks of cerebral disease, said to be sudden, reveal, on dissection, structural changes which can only be the result of morbid processes of long duration, and argues that it is neither logical nor in accordance with fact to suppose that such serious disease of the brain could have been developing itself for months or years, without impairing or deranging the recognised functions of the cerebro-spinal system. It is admitted that the early symptoms of cerebral disease are often so slight as entirely to escape ordinary observation. Dr. Winslow, however, maintains that there are certain precursory diagnostic symptoms which will enable the intelligent and careful physician to discover the presence of incipient disease in the brain, when the patient and those around him repudiate any such notion, and acknowledge no necessity for medical interference. He does not assert that the exact nature or precise locality of the disease can always be ascertained, but thinks it easy to determine the general questions, whether the brain be the seat of disease, and whether the disease be of a primary or sympathetic character.

The importance of an early recognition of disturbed cerebral function is forcibly illustrated in the case of mental disorder:

> " It is a well-established fact, that *seventy*, if not *eighty* per cent. of cases of insanity admit of easy and speedy cure if treated in the early stage, provided there be no strong constitutional predisposition to cerebral and mental affections, or existing cranial malformation; and even where an hereditary taint exists, derangement of mind generally yields to the steady and persevering administration of therapeutic agents, combined with judicious moral measures, provided the first scintillations of the malady are fully recognised, and without loss of time grappled with, by remedial treatment." (p. 18.)

We may remark, by the way, that "to grapple with a scintillation" is rather a queer mode of expression.

Considering it then sufficiently established, that there is in all affections of the brain a precursory stage which it is of the utmost importance to detect, Dr. Winslow proposes to analyse his subject in the following order :—

1. MORBID PHENOMENA OF INTELLIGENCE.
2. MORBID STATES OF MOTION.
3. MORBID CONDITIONS OF SENSATION.
4. MORBID PHENOMENA OF THE SPECIAL SENSES—
   - *Sight.* *Touch.*
   - *Hearing.* *Smell.*
   - *Taste.*
5. MORBID PHENOMENA OF SLEEP AND DREAMING.
6. MORBID PHENOMENA OF ORGANIC OR NUTRITIVE LIFE—
   - *Digestion and Assimilation.* *Respiration.*
   - *Circulation.* *Generation.*
7. GENERAL PRINCIPLES OF PATHOLOGY, TREATMENT, AND PROPHYLAXIS.

In the third chapter, on the " Premonitory Symptoms of Insanity," Dr. Winslow adverts to the close resemblance between many forms of insanity, and the state of the brain and mind during sleep and dreaming, and illustrates it by the correspondence of the state of mind between sleeping and waking, with that of approaching alienation; by the phases of unusual intellectual vigour and acuteness which are developed in certain forms of mental disorder, as well as, occasionally, in dreams; by the incongruous conceptions, fantastic combinations of images, incoherence of ideas, and loss of dominion of the will, which characterize both dreaming and many conditions of disordered intellect; by the rapidity of mental action which compresses the events of hours, days, or years into a few minutes or seconds of time, and which is common to dreaming and to insanity; and by the clear apprehension which the mind sometimes evinces in both states of its morbidly automatic condition:

> "A person whilst under the influence of a series of fanciful occurrences, created by dreaming, or insanity, will occasionally acutely reason with himself as to the *reality of the images* occupying the attention, and be fully conscious that he is insane or dreaming." (p. 44.)

We know not how far it may have been attempted to compare the states of sleep and dreaming in the sane and the insane. Such a comparison would be beset with great difficulties, but might, perhaps, yield some useful results. In another part of his work, Dr. Winslow gives a very singular case in which insanity appears to have had its commencement in a dream, and to have been a continuation of the train of perturbed thought which arose during sleep. (pp. 614–15.)

In the fourth chapter, "Confessions of Patients after Recovering from Insanity, or, the Conditions of the Mind when in a State of Aberration," our author observes that—

> "The autobiography of the insane, embodying a faithful record of the state of the intellect, emotions, and instincts, whilst fading into a condition of alienation, as well as an accurate account of the condition of the mind after its complete subjugation by disease, proceeding from the pens of persons who have passed through the terrible ordeal of insanity, opens a new and profoundly interesting page in the history of the pathology, as well as philosophy, of the human mind. And it may be asked—Is it possible for the insane accurately to describe the state of their mind during a paroxysm of mania? Can they have any recollection of their incoherent ramblings, wild and fanciful imaginations, horrible and frightful hallucinations? In many cases, such is the fact. Insanity does not invariably overthrow and alienate *all* the powers of the understanding." (p. 47.)

Dr. Winslow gives *in extenso* several such records, which are highly interesting; but it would, of course, require a large accumulation of similar documents to afford any sufficient data for general inferences.

The following chapter, on the "State of the Mind when Recovering from an attack of Insanity," contains also several interesting cases. There is a passage in one of them which is highly suggestive:

> "I felt I was recovering, the delusions gradually losing their hold upon my fancy. I then began to entertain doubts as to their reality. I felt disposed to listen patiently to the judicious advice of my physician. I was no longer irritated at being told that my perceptions were false, and began to appreciate the absurdities of other patients." (p. 150.)

This shows the advantage of allowing the lunatic, where he is not dangerous, to exercise his social instincts by keeping company with other lunatics; and it shows also the propriety on the part of the physician of waiting patiently for the moment when sane advice may be administered. While the patient remains under the influence of a strong delusion, the worst thing we can do is to argue with him; but when we perceive that he is gradually becoming rational, he may be greatly encouraged and benefited by our acquiescence in his improved views.

In his sixth chapter, Dr. Winslow treats of the statistics of insanity among children, and of anomalous and masked affections of the mind. In reference to the former subject, Dr. Boutteville's observations give 0·9 per cent. of the ages from five to nine. Drs. Aubanel and Thorpe observed, in the Bicêtre, in the year 1839, eight cases of mania and one of melancholia in patients from the age of eleven to eighteen years. Dr. Brierre de Boismont states as the result of his own experience, that among forty-two young people in whom the mental disease commenced between fourteen and sixteen years of age, eighteen inherited it from their parents. In by far the greater number of cases, the disease was connected with the age of puberty and menstruation. Almost all the patients were stated to have been as children, sometimes sad, and at others wild and ungovernable; incapable of steady application to work; either not possessed of talent, or exhibiting it only in momentary flashes; refusing to submit to any rule; some apathetic, and not to be excited by emulation; others exhibiting a volatility not to be repressed. Many had been subject to spasmodic attacks. In eighteen instances recovery took place, but there was a liability to relapse; there also remained a remarkable strangeness of character and an inability to assume any fixed position in life; and some gave but insecure evidence of the recovery being permanent. The conclusion is, that the mental alienation of children and young people is a most serious form of insanity, partly from their antecedents, and partly from the imperfect development of the cerebral and other organs. (pp. 166–7.)

In respect to masked and anomalous mental affections, Dr. Winslow comments with ability on those cases in which the mind may be said pathologically to be disordered, though the patient be not insane in the legal acceptation of the term. He asks, "Have we in practice sufficiently appreciated this distinction?" and intimates that—

> "Fearful of committing ourselves to an opinion that might authorize an interference with the free agency of the patient, and justify the use of legal restraint, there has existed an indisposition to admit the presence of positive mental disorder, even in cases where it has been obviously and painfully apparent." (p. 173.)

He adds that this excessive caution has often been productive of irremediable mischief:

> "This type of mental disorder," he continues, "exists to a frightful extent in real life. It is unhappily on the increase, and it therefore behoves the members of the medical profession, as guardians of the public health, as philosophers engaged in the loftiest and most ennobling of human inquiries, as practical physicians called upon to unravel the mysterious and complicated phenomena of disease, and administer relief to human suffering, fearlessly to grapple with an evil which is sapping the happiness of families, and to exert their utmost ability to disseminate sound principles of pathology and therapeutics upon a matter so intimately associated and so closely interwoven with the mental and social well-being of the human race." (p. 174.)

Dr. Winslow states that his observations do not refer to ordinary instances of eccentricity, to idiosyncrasies, or to those cases in which one absorbing idea exercises an undue influence over the thoughts and conduct; nor to examples of irritability, violence, coarseness, brutality, vicious or criminal propensities, caprice, or extravagance, which are unhappily too often natural to the individual in the state of health; but to those cases only in which such peculiarities can be clearly shown to be the results of disease. He directs attention to the facts, that while such morbid phenomena sometimes exhibit themselves in an exaggeration of some natural peculiarity, they present at other times a direct antithesis to the ordinary character of the patient.

In considering the legal bearings of such cases, he ably advocates the necessity of medical, as the only competent testimony; observing that—

> "We have recourse to able, skilled, and scientific witnesses to elucidate difficult and disputed points in engineering, architecture, mechanics, navigation, feigned writing, chemistry, and many of the exact as well as speculative sciences, and upon what ground should we repudiate the testimony of learned and experienced men, practically acquainted with the phenomena of insanity?" (p. 214.)

He shows the inconsistency exhibited by courts, juries, and the public, according as the case is one of murder, suicide, or *de lunatico inquirendo*. In reference to the first, he remarks—

> "The public mind is violently shocked at the commission of a horrible and brutal murder. The act is viewed in the abstract as one of great and barbarous atrocity, apart altogether from all its concomitant extenuating medico-psychological considerations." (p. 224.)

In reference to the two latter, he says—

> "The jury, in the one case, is most anxious (influenced, no doubt, by right and charitable motives) to protect the memory of the *suicide* from the imputation of *sanity*; and in the second instance (totally ignorant of the extent of desolation and misery that are, alas! so often entailed upon families by an obstinate determination not to recognise the existence of insanity), they stretch a point to shield the subject of inquiry from what is unphilosophically termed the *stigma* of mental derangement." (p. 218.)

And he then shows how unjustly medical witnesses are extolled or abused, according as their testimony runs with, or counter to, the current of popular prejudice.

From the multiplicity of subjects treated of in Dr. Winslow's work, our notice of it must necessarily be confined to a few somewhat desultory remarks.

When treating of the spectral illusions which are common in the first stage of insanity, or that of "consciousness," Dr. Winslow cites an extraordinary case from the 'American Journal of Insanity' for October, 1859; but makes no comment on the singular circumstance, that several persons whose visionary forms appeared to the patient, are alleged to have died just at the time of the apparition.

In the chapter on the state of "Exaltation," when speaking of feigned insanity, he remarks that it is often unmasked by placing the patient under the influence of chloroform, and proposes the same procedure as a means of detecting lunacy when cunningly concealed. He says that "there can be no doubt as to the effect of chloroform in giving, in a particular type of case, great temporary prominence to insane delusions" (p. 279), and states that he has sometimes observed hallucinations previously latent, or feebly manifested, to be brought into prominence under its influence.

Under the head of "Mental Depression," he observes that, "If the evidence generally adduced at the coroner's inquest is to be credited, in nearly every case of suicide cerebral disorder has exhibited itself, and the mind has been clearly and palpably deranged." (p. 300.) He is of opinion that cases in which persons are impelled to self-destruction by some concealed delusion are more frequent than is generally imagined. In this we agree with him; indeed, we believe that the disposition to suicide is seldom entirely unconnected with delusion. Those cases in which it is so must belong to the category of perverted instincts.

Dr. Winslow has many good remarks on "The Morbid Phenomena of Attention;" and justly regards impaired power of attention as entitled to serious consideration in connexion with incipient cerebral and mental disease.

On the subject of the *memory* of the insane, Dr. Laycock doubts the accuracy of the opinion entertained by many, that this faculty is the first to decay:

> "It is true," he says, "that in many cases the patient has but a feeble and confused recollection of the transactions of recent date; but is able vividly to recal to the mind the scenes of early life. It is undoubtedly a fact, that the conversations of old, incurable lunatic patients relate principally to the events of past years; but, at the same time, they do not manifest that utter obliviousness and forgetfulness of recent circumstances that Dr. Haslam and others appear to believe. I have witnessed some singular instances among the insane of extraordinary retentiveness of memory, relating to recent transactions; but I am bound to admit, as a general postulate, that this faculty is found, in the majority of cases, in an impaired and muddled state." (p. 425.)

In the chapter on the "Morbid Phenomena of Sensation," Dr. Winslow directs particular attention to the subject of epileptic vertigo—the *petit mal* of the French writers. He represents it as occurring at all periods of life, and in various degrees of severity. He affirms it to be a common affection in childhood, often fatally undermining both the bodily and mental constitution before its existence is suspected. He says that "there is no type of epilepsy so fearfully and fatally destructive to the intelligence" as this:

> "It is generally associated with obscure and not easily detected or defined changes in the cerebral tissue. These pathological alterations are more particularly diagnosed* in the advanced stage of the affection. Hence the grave importance of an early recognition of this subtle and insidious form of vertigo, and the necessity for a speedy administration of remedies for its cure." (p. 543.)

Chapters XXI. and XXII. contain an interesting account of the morbid phenomena of the special senses, into which, however, our space will not allow us to enter.

The last chapter is on the "General Principles of Cerebral Pathology, Diagnosis, Treatment, and Prophylaxis." In the consideration of these subjects, our author has been carried beyond the proposed limits of his present work. We do not know that we need notice this concluding portion of it, further than to mention that, on the morbid anatomy of insane cases, Dr. Winslow seems to agree in general with the best observers, and, like them, acknowledges the frequent absence of any appearance which can throw even the smallest light on the mental disorder.

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* "Diagnosticated," we should say; but the strange verb "to diagnose," is now in continual use among medical writers.

We have read Dr. Winslow's work with pleasure. It contains an immense mass of information, derived from various sources, and a great many judicious practical remarks, evidencing the large experience of the author. What we should be disposed to cavil at, is the style in which it is written, and which is here and there both redundant and inaccurate. In spite of this, however, the book reads very pleasantly. It affords some examples of good, and even eloquent composition, so that the defects of other passages are probably more attributable to carelessness, than to want of literary power.

REVIEW X.

The Physiology of Common Life. By GEORGE HENRY LEWES, Author of 'Sea-side Studies,' 'Life of Goethe,' &c. In Two Volumes. —*Edinburgh and London*, 1859–60. Post 8vo, pp. 940.

MR. GEORGE HENRY LEWES has long been well known in the literary world as a writer of distinguished ability and remarkable versatility. There are few of our leading periodicals to which he has not been an esteemed contributor; and if his anonymous writings were collected, we believe that they would alike surprise us in regard to the range of subjects over which he has travelled, and the freshness and vigour he has shown in the treatment of every one. Of his acknowledged works, his 'Biographical History of Philosophy' (1845), though bearing evident marks of Comtist discipleship, and not even pretending to impartiality, has acquired for itself a considerable repute as a very readable and in some respects original book on a dry subject. 'The Exposition of the Principles of Comte's Philosophy,' however, which he subsequently (1853) gave to the world, has been less successful; partly because that philosophy is not to the taste of the most intelligent class of thinkers on this side of the Channel, and partly because the expositor, through a want of practical familiarity with the sciences from which he professed to draw his illustrations of his master's principles, was found to have committed so many blunders in his exposition, as seriously to weaken if not entirely to destroy the credit it might otherwise have obtained. In the interval between the appearance of these two works, Mr. Lewes's pursuits, so far as we can judge of them from their ostensible results, appear to have been mainly if not exclusively literary. In 1846 he published a work on 'The Spanish Drama: Lope de Vega and Calderon.' In 1847 he produced 'Ranthorpe: a Tale;' and in 1848 a regular three-volume novel, entitled 'Blanche, Rose, and Violet.' In 1849 he brought out 'The Life of Maximilian Robespierre, with Extracts from his Unpublished Correspondence.' He then turned his attention to dramatic composition, and in 1850 published a tragedy, entitled 'The Noble Heart,' which is stated to have been acted with marked success. It was, we believe, about this time, though we are not sure of the precise date, that he also made his appearance on the stage, the part of "Shylock" being one which he performed at the Manchester Theatre. From the commencement of the *Leader* newspaper in 1849, to the year 1854, he acted as its literary editor. In 1855 he completed his largest and most important literary effort, 'The Life and Works of Goethe; with Sketches of his Age and Contemporaries, from published and unpublished Sources.' The preparation of these volumes (partly carried on at Weimar) must have been the labour of years, so extensive is the research of which they bear evidence, and with such care and finish are the materials elaborated. We believe that even German exhaustiveness confesses that Mr. Lewes has got together almost everything about the poet-philosopher that is worthy of preservation; and the chief fault found with the work by British critics has been, that the author displays too great an indulgence for Goethe's very loose morality in regard to the relations of the sexes.

We have thought it right thus to enlighten our readers with respect to Mr. G. H. Lewes's "antecedents," because we have observed that his literary repute has brought him into a degree of scientific credit with the uninformed public, to which he can lay no rightful claim. He seems to have first applied himself to the practical study of Natural Science as a refreshment after the completion of his *opus magnum;* and he took up the then fashionable study of Marine Zoology with considerable energy, and showed no small amount of ability as well as of zeal in its pursuit. Under the title of "Sea-side Studies" he contributed in 1856 and 1857 a series of papers to 'Blackwood's Magazine,' which at once attracted attention for the vivid freshness with which the author's personal experiences were presented, the unexpected extent of the acquaintance which he displayed with some of the abstruser parts of the subject, and the ingenuity of many of the doctrines which he advanced. The well-informed critic, however, could not fail to perceive that Mr. Lewes put forward as novelties of his own discovery many things which had become known long before to the best scientific authorities; and that, whilst calling in question the opinions currently received upon a variety of subjects, he showed a much greater capacity for detecting and exposing any weaknesses in their foundations, than for impartially deciding how far such an invalidation really amounted to an overthrow. It appeared, in fact, to be in his mind quite sufficient to advance some observation made by himself, with any deduction from it that his logic sanctioned as justifiable, for the discredit of even the most authoritative and generally accepted statements made by men who had devoted as many years to these pursuits as he had given months. And so far from his showing any scruples in thus bringing into doubt the scientific credit of the acknowledged masters in the department of research in which he was himself but a beginner, nothing appeared to afford him greater pleasure than to deal the most downright blows with the sledge-hammer of direct and unhesitating assertion on the head of any unlucky philosopher who might chance to come in his way.

We are by no means insensible to the advantage which scientific inquiry derives from the occasional entrance of a new and vigorous spirit, disposed to take nothing for granted, and showing neither reverence for personal authority nor respect for established opinion. It is good for us all to be sometimes disturbed from the routine into which we are apt to fall, and to be induced to look at the foundations of our opinions with a careful scrutiny. There is no doubt that, without our knowledge, many of these may decay with the course of time, and others may be rendered insecure by the loss of some prop on which we had not been aware that they were resting. And so far from being disposed to quarrel with Mr. Lewes when he announced his intention of extending his studies and his popular expositions of their results, from Marine Zoology to Human Physiology, we were quite ready to welcome the advent of a new and energetic labourer, who might help us to find out the weak portions of our existing fabric of doctrine, and might assist us to replace such as a careful examination should prove to be unsound, with stronger and more durable material. We were quite prepared for a trenchant criticism of currently received principles, and even for a denial of many opinions that we had supposed to be almost undeniable. But we must own that we had not expected that Mr. Lewes would depart so widely as he has done from the reputed standards not only of opinion but of fact; or that in so many instances in which he does not profess to have corrected the statements of others by researches of his own, he would content himself by simple affirmations to the contrary. The unhesitating way in which these affirmations are put forward is well calculated to impose upon the unwary reader, to whom Mr. Lewes gives not the slightest hint that his statements are even questionable. And the argumentative skill by which he can convincingly show that his opponents have not a leg to stand on, when his whole series of inferences is vitiated by the downright falsity of the assumptions on which they are based, renders him a most dangerous guide to the Student, who is apt to attach more value to the cleverness and brilliancy of a superficial dogmatist, than to the scrupulous caution of a truly profound and philosophic writer.

Had Mr. Lewes addressed his work to the unscientific public alone, we might have contented ourselves with sounding a general note of caution as to its untrustworthy character. But he claims to be something very different from a mere expositor; and sets up his own authority as the ultimate standard of appeal as to the issues which he raises in every chapter between his predecessors and himself:

> "I could not bring myself," he says in his Preface, "to publish, on the authority of respected names, statements which I knew to be false, and opinions which I believed to be erroneous. After having laboured earnestly to get at

the truth, it would have been disloyal to contribute in any way to the spread of what I believed to be error. All that I felt bound to do, was to state impartially the facts and opinions current amongst physiologists; and, when those opinions seemed inadmissible, to state the reasons for their rejection."

This *looks* very honest and straightforward; and only suggests the question whether a man of mature years, whose previous pursuits have been of a very different character, and who has adopted certain habits of thought and a certain method of philosophizing which have tended to foster an overweening confidence in his own sagacity, is the man who has the right to assert, when he has scarcely had time to take breath after his first plunge into a subject so intricate as Physiology, that he alone has sounded its depths, and is qualified to say of every one from whom he differs, that he not only believes his opinions to be erroneous, but that he knows his statements to be false. A more modest man would have been inclined to question whether the error might not possibly lie on his own side; and would have thought it worth while to look a little into the history of the subject, before giving expression to his denials of current opinions, that he might see whether other persons had experienced his own difficulties, and whether these might have been already considered and disposed of. But Mr. Lewes's tendencies are so decidedly iconoclastic, that there is nothing which seems to delight him so much as smashing the *idola* of what he deems an erroneous system. He appears to forget, however, that this is a game at which two can play; and that possibly some one of those whom he has treated so cavalierly may upset the new *idolon* which he would set up in his own shape for the worship of his admiring followers.

As Mr. Lewes claims nothing less than to be considered the Reformer of Physiology, we deem it our bounden duty to examine into his pretensions; and especially to prevent his literary reputation from lending an adventitious value to his scientific teachings. Our space will not permit us to discuss more than two of the many subjects which offer themselves to our encounter; these being, the Chemistry of Food in its Relations to Nutrition and Respiration, and the General Functions of the Nervous System.

How far Mr. Lewes can be taken as a trustworthy guide as to facts about which there can be no kind of dispute, when he has any point to gain by misrepresenting them, may be judged from the following case which very early impressed itself on our attention as a remarkable example of his reckless audacity of statement. In one of his papers on "Food and Drink," in 'Blackwood's Magazine,'* having taken up an attitude of unmitigated hostility to Liebig's well-known view of the Chemistry of Food, he thus expresses himself in regard to Liebig's assertion that only nitrogenous substances are capable of conversion into blood:—"It almost takes our breath away to alight on passages like these;" and in justification of his astonishment he thus proceeds:

"Examination of the structure of the blood shows that so far from being composed exclusively of nitrogenous substances, it is composed of a variety of substances, among which the nitrogenous albumen and fibrin amount to not more than 72 in 1000 parts; and if a trifle more be added for the globulin and hæmatin of the blood-discs, that is all the nitrogen of the blood said to be solely composed of nitrogenous substances."

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* Vol. lxxxiii. p. 334.

A trifle to be added for the globulin and hæmatin of the blood-discs!—when, as Mr. Lewes himself tells us in a subsequent paper of the same series (p. 695), these constituents of the blood amount to 131 parts in 1000. The nitrogenous constituents of the blood but a fraction of the whole!—when, according to the analysis he subsequently cites as trustworthy, out of 216 parts of solid matter (for no one, we suppose, reckons the water in a question of this kind) the recognisable nitrogenous constituents, albumen, fibrin, globulin, and hæmatin, amount to more than 202 parts, the ill-defined substances of the "extractive" (of which a portion, at least, are highly nitrogenous) to 5½ parts, the saline substances to 6 parts, and the fats (which are the only recognisable non-nitrogenous organic compounds in the blood, except when a minute fraction of sugar can be detected) to less than 1½ part. Truly Mr. Lewes far outdoes Liebig in the vehemence of his blows; he not only takes away our breath, but positively stuns us. In fact, we were so completely prostrated by this knock-down assertion, that though we entertained some faint notion of appealing to Mr. Blackwood for mercy on behalf of truth, we could not summon energy to do so; and were obliged to content ourselves with a faint hope that the extension of Mr. Lewes's physiological studies from Food to Blood might suggest to him the possibility that he had made an unfair hit, and that he might be generous enough to abstain from taking advantage of it.

We looked, therefore, with a mixture of apprehension and curiosity to the corresponding portion of the treatise before us; and we find (vol. i. p. 80) the following repetition, almost *totidem verbis*, of his former statement:

> "Examination of the structure of the Blood shows that, so far from being composed exclusively of nitrogenous substances, it is composed of a variety of substances, among which the nitrogenous albumen and fibrin amount to less than 80 in 1000 parts, *including what must be added for the globulin and hæmatin of the blood-discs:* that is *all* the nitrogen of the blood said to be composed solely of nitrogenous substances. No one knows this better than Liebig himself; yet his argument entirely overlooks it."

Now at p. 262 of the same volume, we not only find Mr. Lewes repeating the analysis of the blood already cited, in which the sum of the nitrogenous constituents just enumerated is not 80 but 202·7, but giving the following as the percentage composition of Ox-Blood when all its water is removed:—

Carbon	51·95
Hydrogen	7·17
Nitrogen	15·07
Oxygen	21·39
Ashes	4·42
	100·00

Now the per-centage composition of Albumen being as follows:

Carbon	53·50
Hydrogen	7·16
Nitrogen	15·50
Oxygen	22·54
Sulphur	1·30
	100·00

the ultimate composition of the Blood as a whole, on Mr. Lewes's own showing, scarcely differs in its proportion of nitrogen from that of Albumen; and yet Mr. Lewes is bold enough to assert, when it suits his purpose to do so, that the nitrogenous substances of the blood amount to no more than 80 parts in 1000! If he believes his own statement, he must have a wonderful power of deceiving *himself;* if he does not, he must possess an unbounded reliance on the gullibility of *his readers.* For conceding to him the full benefit of the salines and the extractive, in addition to the fat, the non-nitrogenous constituents of the blood cannot be reckoned by any possibility as more than 14 parts to 202 of nitrogenous. It is just possible that Mr. Lewes may reply that he reckons the *water* of the blood among its non-nitrogenous constituents; if so, then we have an equal right to claim the water of the liquor sanguinis as a constituent of its albumen and its fibrin, the water of the corpuscles as a constituent of their globulin and hæmatin; the water of flesh as a constituent of its syntonin; and the water of fibrous tissue as a constituent of its gelatin. For water bears just the same relation to each of the components of blood, as it does to the blood as a whole; and the relative proportion of the nitrogenous and non-nitrogenous *organic compounds* (and it is about these that the whole question is raised) is not appreciably affected whether we consider them in their moist or in their dry state.

We are far from desiring to uphold the "Chemical Theory of Food," as crudely and dogmatically put forward by Liebig in the first instance. It is perfectly clear that the fitness of any particular substance to serve as plastic or flesh-forming material cannot be estimated merely by the per-centage of nitrogen it may contain. It is clear, too, that either fat, or some non-azotized substance which may be turned into fat, is required as a constituent of food, for the purpose of forming tissue. Mr. Lewes is fully justified in the statement that "not a cell, not a fibre can be formed, nor can subsist, without a certain amount of fat and salts." But we are utterly at a loss to comprehend how, with the facts before him to which we have just referred, Mr. Lewes can go on to say: "*Not a tissue can come into being, nor continue its functions, without a large proportion of non-nitrogenous materials—a proportion greatly exceeding the nitrogenous.*" The materials of tissues are of course derived from the blood: it is in the blood, therefore, that we are to look for this "large proportion" of non-nitrogenous substances; will Mr. Lewes kindly enlighten our ignorance, and show us how to find it there?

Not satisfied with dwelling on the acknowledged difficulties and defects of the chemical theory of food, in the form in which it was originally brought forward, Mr. Lewes treats it as if it had been completely overthrown, and as if the distinction between the *plastic* and the *respiratory* or *heat-producing* constituents of food had no foundation whatever. Now it is admitted by everybody that to suppose that albuminoid substances, being plastic, are not also heat-producing, would be altogether fallacious; but we have never met with any one who maintained such a position. Liebig most distinctly recognised their calorific power; but urged with truth that viewed merely as heat-generators they are not only more costly but are less efficient than non-nitrogenous substances; and that the most economical and efficient system of dieting will afford such a supply of albuminoid substances as is needed to replace the disintegrated tissues, together with a supply of non-nitrogenous material adequate both in nature and amount to keep up the temperature of the body. So, again, it is now admitted on all hands that the presence of fat is necessary for the generation of tissue; and that consequently neither fat, nor the non-nitrogenous substances which are capable of being converted into it, can be properly regarded as non-plastic and purely calorific. But such an admission by no means militates against the fact, now established by a large experience, that fat is the most efficient of all articles of diet as a heat-generator, and that the power of resisting long-continued exposure to extreme cold mainly depends upon the available supply of that substance; which is precisely what chemistry teaches.

In selecting his facts to throw discredit upon Liebig, Mr. Lewes has confined himself to those which happen to suit his purpose; and has consequently, as has been well shown by Dr. Daubeny,* ignored the large body of evidence of a much more satisfactory kind, which can be adduced in support of the general doctrine just stated. Thus, for example, the comparative dietetic experience of different nations, whose physical and mental characters, religious observances, and general habits of life, greatly influence the result, is not of nearly the same value as the comparative experience of bodies of men similarly circumstanced, as nearly as may be, in all other particulars than as to diet on the one hand, and either bodily labour or exposure to cold on the other. Now those who have carefully collected evidence respecting the comparative performance of that lowest class of labourers whose chief diet consists of potatoes, of that middling class who are sufficiently well paid to afford bread, of that upper class who can add a little meat, and of that aristocracy (the railway "navvies") who consume their two or three pounds of animal food per day, have ascertained that the relative amounts of work which can be got out of these several classes of men is strictly proportioned, not to the gross quantity of food which they respectively take, but to the amount of albuminoid material which that food contains. And in like manner, when a similar comparison is made between the experience of individuals or of bodies of men exposed to different temperatures, it is found that the diet on which heat can be adequately supported in even the colder temperate climates, needs to be supplemented by an additional proportion of fat or of some other efficient heat-producing material, to make it fit for the maintenance of the vigorous calorification needed by those who have to endure the rigours of an arctic winter.

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* Gardeners' Chronicle, Dec. 24th and 31st, 1859.

Mr. Lewes thinks that he sufficiently disposes of facts of this latter class, by saying (vol. i. p. 183) that the gluttony of the Hottentots is quite as remarkable as that of the Samoyedes and Esquimaux; but, with his habitual disregard of what does not suit his purpose, he forgets to tell his readers, that whilst the travellers whom he quotes inform us that the *ordinary diet* of an Esquimaux consists of twenty pounds of flesh and oil daily, the consumption of enormous quantities of food by Hottentots and Bosjesmans is quite exceptional, and alternates (as in the case of many wild animals) with long periods of fasting. If Mr. Lewes had taken the trouble, which we have done, to collect his facts directly from the most intelligent and experienced officers of our Arctic expeditions and of the Hudson's Bay Company, he would scarcely have committed himself to the assertion that cold produces an increased appetite, because "more exercise must be taken in cold weather to develope the necessary amount of animal heat, more tissue must be wasted, and consequently more supply is needed for repair." (vol. i. p. 184.) For it is perfectly well known to the class of persons to whom we have just referred, that the increase of appetite bears no kind of relation to the amount of exercise taken; and that it is not for food indiscriminately, but especially for that of an oleaginous kind. Gentlemen who at home are squeamish about a morsel of fat, and at first look with utter astonishment at the relish of the old Hudson's Bay settlers for venison steaks with five or six inches of fat upon them, begin to find their squeamishness departing so soon as the winter fairly sets in; and in the course of a month or two they come to eat a liberal allowance of fat with a thorough enjoyment of it.

That by far the larger proportion of this fat must be "burned off," to use Liebig's phrase, without ever being converted into tissue, we apprehend that every well-informed physiologist, however indisposed he may be to accept the chemical theory of animal heat as sufficient, must be ready to admit. For let us look what monstrous assumptions are required by Mr. Lewes's doctrine that no food is applied to the maintenance of heat, until it has been first subjected to the process of tissue-formation, and has been then set free by the waste consequent upon exercise. In the first place, it must be assumed that, by some wonderful process of transformation which Mr. Lewes does not attempt to explain, fat to any amount can be turned into the substance of muscle. Such an assumption may pass current with those who have already been satisfied with Mr. Lewes's assurance that "not a tissue can come into being, nor continue its functions, without a proportion of non-nitrogenous materials greatly exceeding that of the nitrogenous;" but it cannot impose on such as really know the facts of the case. That muscular fibre can be generated at the expense of anything else than albuminoid material, combined with a minute proportion of fat and the requisite salines, we may safely challenge Mr. Lewes to prove.—Further, if his doctrine were correct, the power of producing heat, in persons exposed to extremes of cold, must depend upon the amount of exercise they take; so that, at the freezing point of mercury, a man could not sustain his warmth without taking at least twice as much exercise as at the freezing point of water. So far from this being the case, the Esquimaux and Greenlanders are a people of notoriously inert habits; so that, even when in want of food, they often show themselves indisposed to make the smallest exertion to procure it; contrasting in this respect most remarkably with the Guachos of the Pampas, who almost pass their lives in the saddle, notwithstanding their exposure to a tropical temperature.

We presume that we need scarcely take the Nervous and the Adipose tissues into account in this discussion. They are the only tissues into which oleaginous matter enters in any large proportion; but it will scarcely be maintained that the brain and nerves of a stolid and inert Esquimaux use up ten or twelve times as much fat in a given time as passes through the nervous system of a physically and mentally active man of business in our own metropolis. And all the evidence we possess in regard to the ordinary rate of change in the adipose tissue (whether forming separate aggregations, or interstitially distributed amidst other tissues) would lead us to set it so low that it may be practically disregarded; the fat of the body being, as Liebig in our opinion correctly maintained, a sort of reserve-fund, created by the storing-up of the surplus of food, and ready to be drawn upon whenever there is a deficiency to be made good.

On the whole, then, we conclude, that the chemical theory of food has a broad and substantial basis of truth, in regard alike to the nutrition and to the calorification of the body; and that although, in its present state, it fails to account for a great number of facts, and may even seem to be antagonized by others, yet that to seize upon these exceptional cases as completely disproving it, is only less false in philosophy than to set up a contrary doctrine upon the basis of assertions which are not only utterly without proof, but are so utterly and unmistakeably negatived even by the facts admitted by its author, as to make it difficult to understand how his blindness to their cogency can be anything else than wilful. When Mr. Lewes can show that a man, whether of European or of native race, can, whatever be his degree of activity, sustain his heat through the prolonged rigour of an Arctic winter, with no other support than the daily ration of the few slices of lean beef on which the Guacho puts forth an amount of muscular activity which is probably not surpassed elsewhere, and when he has shown that the Guacho can substitute for his lean beef an equivalent amount of blubber without the loss of his bodily energy, or that the energetic English "navvie" can sustain his heavy toil by filling his stomach with potatoes like the dawdling Irish peasant, he will have a right to assert that the composition of different kinds of aliment affords no clue whatever to its nutritive or its calorific value, and that we ought "to reject, as misdirected labour, all attempts at establishing anything more than chemical facts in the Chemistry of Food." (vol. i. p. 113.)

We shall now follow Mr. Lewes into a very different portion of the field traversed by his inquiries; and shall examine whether he is more to be trusted as an expositor of the functions of the Nervous System, than we have found him to be as to those of Organic life.

Adopting as well-marked and of essential importance the structural differentiation of nerve-cells and nerve-fibres, Mr. Lewes holds that each of these elementary parts has its own distinctive property or attribute; that of the nerve-cells being *sensibility*, and that of the nerve-fibres being *neurility*. The former of these terms, as every physiologist knows, has been employed in a variety of acceptations; but in this country its meaning has gradually settled itself into accordance with its etymology,—some recognisable *feeling*, or affection of the *consciousness*, being almost universally understood when *sensation* is spoken of; and the capacity for such an affection being what is known as *sensibility*. It is obvious from what follows that this is by no means the sense in which Mr. Lewes uses the term; but we have found it difficult to gain any precise idea of the value he attaches to it. For although we find six pages apparently devoted to a reply to the question "What is sensibility?" we have searched in vain for a definite answer to it, amidst the discussions with which those pages are taken up, as to whether physiologists are right in limiting sensibility to the brain or to any part of it, or whether it is a property of the nervous centres generally; and at the end of these we find ourselves brought back to our starting-point, having gained no other information than that "Sensibility is the property inherent in ganglionic tissue, the one peculiar force belonging to all nerve-centres." Now if this definition be adopted, it is obvious that no discussion *can* arise about the limitation of sensibility to any particular portion of the nerve-centres; and that the question between Mr. Lewes and the physiologists whose opinions he controverts is really one of terms and definitions, rather than of facts or of inferences from them. This will become apparent hereafter. It is a little curious, however, that Mr. Lewes does not seem to be always able to keep himself from falling into the current phraseology; for he himself tells us (p. 36), when defending himself against the charge of cruelty in performing experiments on living animals, that chloroform renders them entirely *insensible;* yet he surely would not say that it annihilates all the reactive powers of the ganglionic centres.

By the term *Neurility* Mr. Lewes designates "the property which the nerve-fibre has, when stimulated, of exciting contraction in a muscle, secretion in a gland, and sensation in a ganglionic centre;" and he urges, we think with justice, that this property is something different from the mere capacity to convey a force generated elsewhere, which is implied by the imperfect analogy of the conducting wires of a galvanic battery. For it has been clearly demonstrated by experiments of various kinds, that nerves, so long as they are *living*,—so long, that is, as their normal nutrition is maintained,—have a property not derived from the centres, but belonging exclusively to themselves, which can be called into play by particular stimuli, and can be diminished or annihilated by certain poisons. Although these facts are familiar to physiologists, Mr. Lewes may perhaps fairly claim to have been the first to point out their full significance; and we are disposed to accept his term Neurility (though open to objection on the part of precisians in etymology) as conveniently designating the peculiar attribute of nerve-fibres generally.

We are not prepared, however, to accept his doctrine that there is no functional distinction between what are commonly termed *sensory* and *motor* nerves (more correctly, *afferent* and *efferent*, or *centripetal* and *centrifugal*), except that which arises from their peripheral connexions. Had Mr. Lewes been longer engaged in the study of Physiology, he would probably have been less inclined than he at present shows himself, to rest upon apparent similarity of structure as justifying an inference of identity of property. His dogmatism upon this point, indeed, is absolutely confounding to those who have been accustomed to look with marvel at the diversity of operations performed by elementary parts which present no appreciable structural difference. "The supposed difference between the two kinds of nerves," he tells us (p. 36), "cannot be one of property, because the structure of the two nerves is identical, and identity of structure, we know, implies identity of property." Now let us put this simple case:—In an animal poisoned with woorara, the motor nerves, it is well known, lose their characteristic property; yet they do not exhibit any such appreciable change of structure as would enable Mr. Lewes to distinguish a fibre which has been thus deprived of its neurility from one which still retains that endowment. So, again, within a certain time after the cessation of the circulation, muscular fibre loses its irritability; but no microscopic change reveals this fact, so as to enable the anatomist to predicate the departure of the attribute; it is only by the physiological test of the application of a stimulus that the fact can be determined. Yet in each case, according to Mr. Lewes, the dead tissue *ought* to be alive, because identity of structure logically implies identity of property. But the question really is,—*Are* the dead and the living tissues identical in structure, or do they only *appear* so to our imperfect ken? We might have before us two bars of steel rolled out from the same mass, resembling each other in shape, colour, hardness, and fracture, identical in chemical composition, and not distinguishable by any ordinary test; yet one of these is possessed of a remarkable property that can only be made to exhibit itself by placing the bar in certain conditions adapted to call it into action; and the absence of this property from the other bar can only be affirmed after it has been subjected to the like tests. Yet though one bar is a magnet and the other is not, yet, according to Mr. Lewes's inexorable logic, as the two bars are similar in structure, they must be identical in properties.

To us it appears certain that any fundamental difference of attribute necessarily implies some corresponding difference of structural arrangement, although we may not be able to discern it; and that it is only when we can distinctly trace a definite relation between structure and property, that we have any right to affirm that identity in the former involves identity in the latter. Let us take an illustration, which, though somewhat crude, will serve to make clear our meaning. A watchmaker has a watch put into his hands, that he may find out and remedy the defect which prevents its going. He examines its "works;" and if he finds that the mainspring or the chain is broken, or that the pivots are clogged with rust, or that the escapement is fouled with viscid oil, he recognises a definite structural impediment to their due action, the removal of which will probably serve to restore their going power. But it may be that he finds none of these things, and that the real impediment lies in a deficiency of the primary moving power, which does not reveal itself by any ostensible indication, and can only be judged of by trial. It would be quite possible so to lower the elasticity of the mainspring of a watch, that nothing in its aspect should betray the change it had undergone; the strongly and the weakly-elastic coil of steel being to all appearance structurally the same, although differing in that which, in regard to its function in the watch, is its essential property. The physicist would have no hesitation in affirming that the difference of property between the two states of steel is in itself a sufficient evidence of a difference in molecular arrangement; for although he cannot yet prove the existence of such a difference in steel, it is at once revealed by polarized light in the analogous case of annealed and unannealed glass. And the time may come when he shall be able as distinctly to determine the degree of elasticity in the spring by its molecular structure, as he can now do by the dynamical test of its power to overcome a certain resistance. So it is quite possible that some future histologist may be able to devise means of detecting a structural difference between a nervous or a muscular fibre that has just parted with its characteristic endowments, and one that still retains them; but with the fact staring us in the face that no such difference has been yet shown to exist (we are not ignorant, of course, that obvious degeneration *very soon* manifests it), we must enter our most decided protest against the general assumption that apparent identity of structure in any organized tissues necessarily implies identity of property.

In regard to the particular question before us, our readers will perhaps not be surprised to learn that the arguments adduced by Mr. Lewes in support of his position of the identity in property between the fibres of the anterior and the posterior roots, are no more reliable than his logical deduction from their asserted identity in structure. Their difference of function he attributes entirely to their difference of *peripheral* distribution,—the fibres of the posterior roots being (according to him) exclusively transmitted to the skin, and those of the anterior roots to the muscles; and so far from seeking any assistance from the difference of their central connexions, he boldly proclaims (p. 32) that nothing can be plainer that as both sets of fibres are similarly connected with the ganglionic substance of the spinal cord, both must have a similar functional relation to it; it being only "by an oversight which will one day appear astounding," that physiologists have one and all disregarded this structural and therefore functional similarity. When that day shall come—but not till then—those who had the presumption to call themselves physiologists will be convicted of arrant blindness and stupidity in not having been able to see, even when it was pointed out to them by Mr. G. H. K. Lewes, that the properties of the anterior and the posterior nerve-roots *must* be identically the same, because they are identical in structure, and are similarly connected with the spinal cord. It is, we suppose, our own incapacity to understand logical reasoning which makes us regard it as an objection to this view, that when the nerve-roots are completely divided, irritation of their central extremities is followed by results so essentially diverse as regards the manifestations of pain; for we are assured by Mr. Lewes that this is no objection at all, since the anterior roots minister not to ordinary but to muscular sensibility, the excitement of which (he affirms) would not reveal itself by pain. This last statement will be somewhat startling to those who have either themselves experienced an attack of cramp, or have witnessed the agonies of tetanic convulsion; the pain in each case being manifestly but an exaltation of the ordinary muscular sensibility, as any one may convince himself by making a sufficiently violent effort against some unyielding resistance. Moreover, it is a point by no means so certainly determined as Mr. Lewes would have his readers believe, that the anterior roots *are* the channels of those impressions which excite muscular sensibility; for the experiments referred to by Mr. Lewes as proving the persistence of the muscular sensibility after the division of all the posterior nerve-roots, are far from affording conclusive evidence to that effect. For the division of the posterior nerve-roots in Mammals is followed by results very different from those which show themselves in Frogs; the diminution of the power of executing motions which require guiding sensations being very obvious in the former, though the movements of the latter seem but little if at all interfered with. And we have already pointed out* that this difference is probably due to the fact, that in purely *reflex* movements (to which category we should refer by far the larger proportion of those executed by frogs) there is not that occasion for muscular sensations, which exists in the case of actions springing from those more elevated impulses which constitute a far larger proportion of the whole in the higher Vertebrata. We happen to know, moreover, that M. Brown-Séquard is far from being himself satisfied that his experiments justify the interpretation put upon them by Mr. Lewes; but that he inclines, with us, to the view that the posterior and not the anterior nerve-roots are the channels of the musculo-sensory impressions. But even supposing that the latter were proved to be the case, it would be necessary for Mr. Lewes, in order to make good his doctrine, to prove that the very same fibres minister to muscular sensibility when their neurility is excited at the periphery, as minister to muscular motion when their neurility is excited at the centre,—a doctrine which is opposed to all that we at present know of the endowments of nerves.

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* See vol. xxiv. p. 6.

Further, it is known to every anatomist that it is a pure assumption on the part of Mr. Lewes to assert that the fibres of the anterior roots are distributed exclusively to the muscles, and those of the posterior roots exclusively to the skin. It is in fact rather curious to find him reproving M. Cl. Bernard for stating the contrary, on the ground that "anatomy will not support that assertion;" whilst he dogmatically assumes that the muscles surrounding the hair-follicles are acted on by the fibres of the *posterior* nerve-roots,—with no other reason that we can discover, than that Mr. Lewes will have it so. How, we would ask, is it possible anatomically to separate the fibres of the anterior and the posterior roots in any nerve of mixed endowments? and on what basis, save that of physiological experiment, can any positive statement be made as to their peripheral distribution? The only anatomical evidence that can be safely appealed to, is the analogy of those cranial nerves in which the motor and the sensory fibres are bound up in separate trunks; and this analogy, long since recognised by the sagacity of Sir C. Bell, affords what is to our minds highly probable evidence of the fallacy of Mr. Lewes's statement. For the first and second divisions of the fifth pair, so far from being exclusively distributed to the sensory surfaces, send branches to the muscles, as is clearly seen in those of the orbit; and the seventh pair, before proceeding to the muscles, receives a twig from the fifth, through which its branches are enabled to confer a certain degree of sensibility on the parts to which they are distributed, though, if its trunk be irritated before the entrance of that twig, no signs of pain are given. Further, notwithstanding the copious supply of nerves which the skin of the face and head derives from the fifth pair, it also can be shown to receive filaments from the seventh in parts where it contains an unusual amount of muscular fibres; a fact which is more easily demonstrated in some of the lower animals than it is in man. As, therefore, anatomy fully justifies the belief that the sensibility of the Muscles of the orbit and of the face is due to the supply they receive directly or indirectly from the fifth pair, there is every probability that the muscles of the trunk are supplied by fibres from the *posterior* as well as from the anterior roots of the spinal nerves, and that such supply is necessary to their sensibility;—so, again, as anatomy fully justifies the belief that the contraction of the muscular fibres contained in the Skin is due to the filaments it receives from the seventh pair, there is a like probability that the skin of the trunk receives fibres from the *anterior*, as well as from the posterior roots of the spinal nerves;—no one would be justified in asserting, on this analogy alone, that such is the case; but no one has any right to affirm the contrary, except on the basis of unexceptionable evidence. Mr. Lewes himself admits that no such evidence has yet been obtained in regard to the skin:—"Division of the posterior roots would, *I should anticipate*, prevent the quills of the porcupine from rising up. But there is no experimental evidence at present." Relying, however, on his anatomy and his logic, he boldly advances the following conclusion:—

> "There is no fundamental distinction between the two nerves; both are sensory, and both are motor; but they are so in different degrees. They are, strictly speaking, distinguishable as muscle-nerves and skin-nerves: the muscle-nerves being the channels for muscular sensations and muscular movements; the skin-nerves being the channels for skin-sensations and skin-movements. But inasmuch as the muscle-nerves have an energetic motor function, far surpassing that of the others, the name of *motor* may continue to designate the anterior nerves: and further, as the skin-nerves are channels of more *intense* and more *various* sensations than the muscle-nerves, the name of *sensory* may continue to designate the posterior nerves—it being understood that these are merely verbal distinctions employed for convenience." (Vol. ii. p. 39.)

Truly the followers of Sir C. Bell have reason to be grateful to Mr. Lewes for the permission he so graciously accords for the retention of the terms whose original significance he deems himself to have so crushingly annihilated. We must confess, however, to being so blind, in consequence, perhaps, of our prejudice and self-sufficiency, that we prefer to hold to the doctrine of Bell in its entirety (so far as the functions of the roots of the nerves are concerned), to relinquishing it for that of Mr. Lewes. We would not take upon us, however, to assert that the neurility of the afferent nerve is necessarily and essentially different from that of an efferent; for there is experimental evidence that the influence of stimuli may be transmitted alike centripetally and centrifugally in both kinds of nerves.

It was urged at the Aberdeen meeting of the British Association, at which Mr. Lewes's views were brought forward and discussed, that some difference seems to be shown by the diverse effects of poisons upon the two sets of nerves; woorara, for example, destroying the neurility of the motor fibres, whilst it does not perceptibly impair that of the efferent. To this Mr. Lewes replies, with considerable ingenuity, that the affection of the motor nerves is not universal, being limited to their ultimate ramifications, and not extending to their trunks; and further, that some of the muscular nerves remain unaffected by the agent which paralyses others, the tail of an animal poisoned by woorara continuing to move with vigour, whilst its limbs are motionless,—evidently, he says, because there is some set of conditions which favours the action of the poison in the one case and prevents it in the other, *not* because there is any difference in the property of the nerve-fibre itself. Now here again Mr. Lewes betrays the very limited nature of his acquaintance with the higher philosophy of Physiology and Pathology; for he could not have written as he has on this point, if he had duly studied the *modus operandi* of poisons and of morbific or medicinal agents, in the spirit of Dr. W. Budd and of Mr. Paget. He would have found abundant evidence, that although neither the microscope nor the test-tube can enable the Anatomist to recognise differences in structure or composition between different parts of the skin or of the muscular or nervous apparatus, yet that differences *are* unmistakeably indicated by the way in which these agents search out and fix themselves upon particular spots. How is it otherwise possible to conceive, for example, that the lead-poison, taken into the general current of the circulation, and uniformly distributed through the body, should fix itself only upon the extensor muscles of the wrist-joint and fingers, being withdrawn from the blood (as by a secreting process) in their nutrition, and entering into combination with their substance? It is very easy to *say* that the poison is specially determined to those muscles; but how can such a special determination be shown to be even within the limits of possibility? It might just as well be said that the secretion of urea by the kidney is the result of a special determination of all the urea generated in the system to that organ, instead of depending on the particular selective endowments of its secreting structure. So with regard to the case of the woorara, whilst we admit that the force of the argument is weakened by the restriction of the operation of a limited dose of the poison to certain parts of the motor system of nerves, the non-affection of the afferent nerves remains as a fact of considerable significance.

Notwithstanding, therefore, the implied sneer of Mr. Lewes (p. 31, note), we prefer to hold with Kölliker that the anatomical resemblance of the two sets of fibres can in nowise justify the assumption of their similarity in properties. And even if it should hereafter be proved that those properties *are* identical, it would be, in our apprehension, to their *central* rather than to their peripheral relations, that, as Sir C. Bell long since maintained, we ought to look for the difference in their functional endowments. For whilst Anatomy fails in discovering a structural distinction between a nerve-fibre possessing its characteristic neurility and one that is totally inert, no one has the right to affirm that the structure of the Spinal Cord—confessedly one of the most difficult and obscure subjects in the whole range of anatomical inquiry—furnishes a conclusive negative to a doctrine so probable on other grounds.

We have left ourselves but little space to discuss Mr. Lewes's general scheme of doctrine as to the Functions of the Nervous System; but, as we have already hinted, the apparent originality of this scheme depends rather upon the peculiarity of the language in which it is couched, than upon any essential difference as to matters either of fact or of interpretation between Mr. Lewes and those whose credit he sets himself to overthrow. We must first protest, however, against what we deem the exaggerated idea which Mr. Lewes entertains of the part taken by the Nervous System in the operations of the living organism. "Psychology and Physiology" he tells us (vol. ii. p. 223), "declare that *all actions whatever* are responses of organs to the stimulus of their nerve-centres. Whether the action be the movement of a muscle or the secretion of a gland, it is finally determined by the centre from which the organ is supplied." We, on the other hand, assert it as the unequivocal teaching of that Physiology which is based, not on the superficial studies carried on for a few years by a pretentious individual, but on the comprehensive survey taken of its whole depth and extent by the master-minds who have left the most marked impress on its progress, that the actions of every separate part of the Animal as of the Vegetable organism depend upon their inherent endowments, which are manifested when the requisite conditions of each are supplied; and that neither Nutrition, Secretion, nor Muscular Contraction can be said to depend on the stimulus of innervation, in any other sense than the movements of a horse (to use the very apposite illustration of Dr. John Reid) depend upon the stimulus and control given by the spur and bridle of its rider. That mental states act through the nervous system in modifying and controlling the Organic functions, and that Muscular contraction is more frequently excited in respondence to the stimulus of nerve-centres than in any other way, is freely admitted by every physiologist; but the degree of such action varies in a most marked manner in different cases; and it is most illogical to reason from such secretions as the salivary and the lachrymal, which are placed for obvious reasons more under the control of the nervous system than are the secretions generally, to those which are in more immediate relation to the other functions of organic life. It was long supposed that the secretion of gastric juice *depends upon* the stimulation of the par vagum; and the experiments of Bernard are often quoted as affording a triumphant confirmation of this hypothesis; but they prove no more than that section of the par vagum suspends that secretion for a time, just as a powerful emotion or a strong physical impression on some other part of the body will do; and the masterly experiments of Dr. John Reid remain unshaken in the demonstration they afford, that when the effect of the "shock" has passed away, the secreting action is renewed, and that it cannot then be executed in response to the stimulus of the nerve-centres, though normally under the control of those centres.

Mr. Lewes professes to know something of Development. Will he tell us on what nerve-centre the first segmentation of the ovum is dependent? Will he demonstrate the guiding influence of sensations in the first marking out of the principal organs of the embryo? Will he show us how the movements of the *punctum saliens* can be dependent upon the neurility of nerve-trunks and the sensibility of ganglionic centres which do not come into existence until long after their commencement? If he should reply, that a nervous system is potentially present, though it is not yet structurally differentiated, then we refer him to his own canons of logic, which lead him in other cases (as we have seen) to set up *structure* against *action* as the conclusive test as to what *is* nerve, and to deny, when it happens to suit his purpose, that any structure is nervous which does not happen to realize *his* conception. Thus he has the hardihood to assure us (p. 309) that the nucleated and granular filaments distributed in so peculiar and characteristic a manner over the olfactory region are "almost certainly not nerves;" because they are not distinctly tubular and have no investing neurilemma,—disregarding the fact that they correspond structurally with a certain stage in the development of the ordinary nerves, and that the extent of their distribution corresponds, on the one hand, with the size of the olfactive ganglia from which they proceed, and on the other, with the degree of keenness of the olfactive sense of which the several species of animals give evidence.

The fundamental idea of Mr. Lewes's neurological scheme seems to be that to which he returns again and again as if it were a novel and important discovery, instead of a mere translation of ordinary doctrines into a language of his own.

> "Every excitement of a nerve-centre produces a sensation; the sum total of such excitements forms the general consciousness, or sense of existence." (p. 65.)
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> "Inasmuch," we are told elsewhere (p. 150), "as all these centres have sensibility, they must all be organs of the mind, because they must all minister to the general consciousness."

The automatic character of a large proportion of the actions of the body is not denied by Mr. Lewes, who distinctly recognises it (p. 164), whilst at the same time he asserts that all those actions which are called mechanical or automatic "are determined by the impulse of guiding sensations." Now let us take one out of many cases which might be cited—the propulsion of food along the lower part of the œsophagus, its entrance into the stomach through the cardiac orifice, the closure of that orifice after the food has passed, the peculiar churning movements of the stomach, and the passage of successive waves of chyme through the pylorus, which, like the cardia, opens to let them pass, and then closes to prevent their return. Admitting all these to be reflex acts, that is, to depend upon the stimulation received through a ganglionic centre (though in regard to some of them the fact may be questionable), we ask whether any one, by the most minute attention to his sensations, can perceive either the opening and closing of the cardiac and pyloric orifices, or any one of the stages of that series of actions which Mr. Lewes affirms to be under the influence of "guiding sensations"? We all know what this influence is in the case of voluntary movements. We know that a man who has no *feeling* in his legs cannot exercise the motor power which he still retains, without *looking* at his feet while he walks; and that a mother who has lost the sensibility of her arm cannot sustain her child upon it by the strongest effort of will, unless she keeps it constantly in sight. So, on the other hand, if we exclude, by closing our eyes, the guiding visual sensations by which their motions are ordinarily regulated, and then try to move the eye-balls in any direction, we immediately become conscious of muscular sensations which we do not ordinarily experience, and it is by these that such movements are then guided. But we affirm without fear of contradiction from anybody save Mr. Lewes, that no such affection of the consciousness ever takes place when our food is passing into or out of our stomachs; and that every one who uses terms in the sense in which they are commonly received in this country, would say that he is *conscious* in the one case, and *unconscious* in the other. And the difference in the kind of action which the nervous system performs in the two cases is scientifically expressed by saying, that the *impression* upon the afferent nerves reacts in the latter case through their own immediate centre, without being transmitted to the sensorium; whilst in the former, in virtue of such transmission it occasions that affection of the consciousness which is termed a *sensation.* According to Mr. Lewes's phraseology, however, the consciousness is affected in the one case as well as in the other; only in the one it is the systemic-consciousness, in the other the sense-consciousness. This, again, is a mere question of terms. To our apprehension there are many advantages in keeping to the old phraseology; and in drawing a fundamental distinction between those actions which we feel either necessarily and immediately, or can feel if we direct our attention to them,—and those which we cannot feel, however earnestly we may endeavour to recognise them.

One of these advantages consists in the much simpler and less hypothetical account we are then enabled to give of the cases in which reflex actions of the legs are exhibited in the human subject, after the limbs have been entirely paralysed, as far as their cerebral functions are concerned, by injury of the spinal cord. Mr. Lewes distinctly affirms (p. 265) that in such a case there are *two centres of sensibility,* that is, according to his own definitions, two centres of *mind,* entirely disconnected with each other. In the body of such a patient, therefore, a second *ego,* a distinct personality, is established, having, it is true, a very limited capacity, but possessing at least as much as a Mollusk. And this we are gravely assured by Mr. Lewes that we are bound to believe, not only on the evidences of sensibility presented by the lower segment, but on the evidence of the *unmistakeable volition* presented by the lower extremities of a frog whose spinal cord has been divided. When we find it gravely asserted that a portion of the spinal cord separated from the brain is a centre not merely of sensation but of volition, we cannot but suspect that Mr. Lewes takes as great a liberty with the latter term as he does with the former. And this suspicion is converted into certainty when we find, as we do on another page, that according to Mr. Lewes the current distinction between voluntary and involuntary movements is altogether fallacious, and ought to be abolished. "They are all voluntary. They all spring from consciousness. They are all determined by feeling." (p. 206.) According to this statement, the spasmodic cough which a man does his utmost to repress, is just as voluntary as the cough which is purposely "got up" to put a stop to the tediousness of a long-winded speaker. Though Mr. Lewes may choose to express himself in terms which ignore this distinction, he has no right to affirm that other physiologists are wrong in principle, because they think it well to recognise in language which is sanctioned as appropriate by the use currently made of it, a difference that has a real existence in the experience of every one.

We think it quite useless to pursue the discussion further; since it is obvious that it must be impossible to keep any kind of conditions with an antagonist, who begins with declaring himself free to use the received and approved terms, not merely of science, but of common parlance, in any sense that may suit his purpose. Yet we must not conclude without saying that whilst we deem Mr. Lewes's book to be utterly unsafe as a guide to the student, it presents many features of suggestive interest to readers who are capable of using it aright; and that the ingenuity as well as the boldness with which the author calls in question the received opinions on a great variety of topics, are well calculated to stimulate their defenders to place them, by new and additional defences, beyond the power of even the most dexterous and unscrupulous assailant.

REVIEW XI.

1. *Archiv für Pathologische Anatomie und Physiologie und für Klinische Medicin.* Herausgegeben von R. VIRCHOW.—1854–1859, passim.

Virchow's Archiv. 1854–1859.

2. *Die Cellular-pathologie in ihrer Begründung auf Physiologische und Pathologische Gewebelehre.* Von RUDOLF VIRCHOW. 1859.

Cellular Pathology, based upon Physiological and Pathological Histology. By R. VIRCHOW. 1859.

3. *Journal de la Physiologie.* Publié sous la direction du Dr. E. BROWN-SÉQUARD. Nos. V. VI. VII.—1859.

BROWN-SÉQUARD'S *Journal of Physiology.*

4. *An Inquiry into the Existence of Amylaceous Compounds in the Human Body.* By Dr. BRISTOWE and Mr. ORD. ('Transactions of the Pathological Society of London,' vol. x., p. 299.) 1859.

5. *Beiträge zur Pathologischen Histologie.* Von Dr. THEODOR BILLROTH.—*Berlin,* 1858. "*Die Speckige Infiltration oder Amyloide Degeneration der Lymphdrüsen.*"

Contributions to Pathological Histology. By Dr. T. BILLROTH. 1858. "*The Lardaceous Infiltration or Amyloid Degeneration of the Lymphatic Glands.*'

6. *On the Nature of the Substance found in the Amyloid Degeneration of various Organs of the Human Body.* By FRANCIS HARRIS, M.D. Cantab. 1860.

IN the history of the discovery and advancement of every science, we may remark what may be termed a transitional period, ushered in by the persuasion that the opinions which have hitherto held sway are the fruit of defective observation and erroneous deduction, and characterized, during its persistence, by the origination of numerous hypotheses, to explain and generalize the multitudinous facts which increased activity in research brings to light. In the history of pathology some such transitional period seems now to obtain. The old system of treating diseases as so many morbid entities is seriously shaken; the long prevalent doctrine of inflammation no longer predominates, and every modern observer of distinction is striving to institute general principles in pathology, and to build up hypotheses of the rationale of the morbid changes and products which the great advances in chemistry and microscopy have latterly disclosed.

The more rapid the accumulation of observations or of facts, the more numerous become the hypotheses, or the variations of hypotheses, necessary to reconcile and explain them; and at the present period, when so many ardent investigators are to be found, we are favoured with an annual crop, embarrassing by its richness and by the merits claimed by its several cultivators for the samples they display.

One such hypothesis, which, indeed, has grown like a grain of mustard-seed from amongst the smallest of its race into a wide-spreading theory, is that of amyloid degeneration, the subject of the present article. In 1854 (vol. xiv. p. 439), shortly after the birth of this hypothesis, we called attention to it by articles on cellulose as an animal constituent, and on the morbid condition then described under the name of "the Lardaceous or Cholesterine Disease" (vol. xiv. p. 413). The question of cellulose entering into the constitution of animals, started by Schmidt in the case of the Ascidians, had then become greatly widened, and Virchow contended that an amylaceous substance was to be discovered in the human subject. Virchow would not claim for this material a positive alliance either with starch or with cellulose, as he found it to possess properties peculiar to itself as well as others, partaken by each of those two compounds in common or separately; but Mr. Busk, on the other hand, asserted the existence of actual starch corpuscles, and was seconded in this assertion by Donders, and afterwards by Nägeli, the distinguished botanist, and by Mr. Carter. The chief opponent to this theory of the presence of amylaceous matter in the human system, was Meckel, who, in his able essay on 'Lardaceous Disease' (vol. xiv. p. 413), referred the chemico-physical appearances cited in its favour, to the existence of cholesterine itself, or of some closely allied fat. However, with regard to many of the presumed amylaceous products described by various pathologists, Meckel's interpretation of facts will not apply; for as Virchow and others have demonstrated, the reactions of cholesterine and of the apparent amylaceous compound vary so decidedly, that if care be used the two substances cannot be confounded. For example, though cholesterine may produce a violet or bluish tint with sulphuric acid and iodine, yet unlike amylaceous compounds, it is soluble in alcohol and ether. Moreover, as Virchow remarks,* "no kind of fat is as yet known which presents the three peculiarities—1, of becoming coloured with iodine alone; 2, of remaining colourless with sulphuric acid alone; and 3, of affording a blue colour with iodine and sulphuric acid."

Apart from chemical reaction, the affinity of the amyloid matter to starch was suggested by the laminated character of some of its corpuscles, and Professor Busk and Mr. Carter represented this feature as precisely similar to that seen in starch grains, and insisted on the existence of a hilum in most of the corpuscles, and on the effects of polarized light as decisive of the identity they contended for. Other observers, however, cannot assent to this identity, or to the exactness of the observations on which it is proclaimed. They find neither the polarization nor the hilum to accord so precisely with starch granules, and unlike these last, the substance mainly in dispute—viz., that concerned in amyloid degeneration, does not assume a blue colour with iodine alone, although it acquires it, as does cellulose, when sulphuric acid is superadded.

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* Cellular Pathologie, p. 339.

It soon became evident that many of the corpuscles discoverable in the animal tissues, although often physically conformed like starch and laminated, had no chemical relation with that substance or its allies, and it therefore was necessary to distinguish such granules from those which presented an amylaceous reaction with iodine alone, or with that element and sulphuric acid together. Virchow* distinguished the following structures as "*corpora amylacea spuria*"—corpuscles which, whether laminated or not, did not react as amylaceous compounds with iodine and sulphuric acid—viz., 1. Brainsand, as described by Cohn and Busk, and such as the latter asserted to be composed of immature cellulose.† In our multiplied observations on brainsand, as recorded in this Review (vol. xiv. p. 470), no chemical reaction, indicative of amylaceous matter in its constitution, could be detected, not even in its earliest phase, before the salts of lime were deposited within the albuminous matrix. 2. Gelatinous corpuscles, often spoken of as "colloid" particles, but most of which are albuminous in composition. 3. Concentric epidermic bodies, most common in cancroid tumours, and the concentric granules found in the thymus gland. 4. Hassall's bodies, discovered in blood coagula, and first noticed by Gulliver. 5. Medullary matter of diseased growths, described by Virchow himself, which Henle identified with Hassall's corpuscles, and Meckel regarded as a variety of lardaceous deposit. 6. Leucin granules, also enumerated by Meckel among lardaceous matters.

Allowing this to be a tolerably complete list of pseudo-amylaceous animal products, let us now inquire what are the corpuscles or the deposits to which an amylaceous composition is assigned, and what are the organs or tissues in which they occur. In so doing, we will for the time suspend the discussion whether iodine alone, or in conjunction with sulphuric acid, affords distinctive evidence of amylaceous compounds; for whether this be the case or not, the fact remains, that a particular substance is intermingled with, or actually replaces the histological elements of the human body, and exhibits certain chemical reactions.

The proposition, that starch or cellulose, or a closely allied substance, existed in the animal economy, was advanced at first especially in relation to the corpora amylacea, found chiefly in the ependyma ventriculorum of the brain, and of the spinal canal. Virchow, in his recent work,‡ represents the especial seat of these peculiar corpuscles to be in a sort of connective tissue, interstitial between the nerve fibres, and for which he proposes the name of "*neuroglia*." The ependyma or wall of the cerebral ventricles, and of the spinal canal overlying the true nerve tissue, consists chiefly of this "neuroglia," and the greater the thickness of this layer the more plentiful are the corpora amylacea dispersed within it. Moreover, they become much more abundant in those pathological states, wherein the neuroglia increases at the expense of, or simultaneously with, a decrease of the nerve tissue; as, for instance, in the process of atrophy, as illustrated in the posterior columns of the spinal cord in cases of tabes dorsalis.

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* Archiv, Band viii. 1855.

† Journal of Microscopical Science, p. 107. 1854.

‡ Cellular Pathologie, p. 255.

In no other parts of the body (says Virchow), except in the nerves of special sense, which may be considered direct offsets from the brain, are corpuscles precisely analogous in physical and chemical characters to be found. Though not all laminated, the majority of them are so, and present a nucleus-like centre, recalling the appearance of the hilum of starch grains. M. Rouget* asserts that the nucleus of amylaceous corpuscles differs from that of starch granules in being larger and central, and not a brilliant speck, but a granular-looking body. But these presumed differences cannot be sustained; all corpora amylacea have not, as this observer affirms, a central nucleus, nor is an excentric hilum a constant characteristic of starch globules. Neither, again, does the attempted distinction between the nuclear centres in the two sorts of corpuscles universally obtain, as represented. However, it is not quite clear whether M. Rouget wishes to maintain these morphological distinctions as general between the two substances in question; for though he speaks generally of "amyloid bodies," and (p. 92) of those of the brain and prostate gland, as partaking in common of certain characters, yet the observations in his essay apply especially to the minute laminated concretions found in the latter.

Busk and Donders stated that the same black cross developed by polarized light in starch grains was elicited also in the corpora amylacea of the brain. Mr. Carter attested the same phenomenon in the corpuscles he examined. On the other hand, Dr. Bristowe and Mr. Ord† assert that the cerebral granules "presented no cross when examined by polarized light." This point, therefore, must be considered at present *sub judice*, but it is not to be left unnoticed that the two observers last quoted state that the corpora amylacea they examined "did not appear to be laminated," a statement at variance with the observation of all other microscopists, who, if they figure some such bodies without lamination, do so of only the minority. Other slight differences from starch-grains, in the chemical reaction of corpora amylacea, are pointed out by Messrs. Bristowe and Ord in the dark reddish-black instead of the blue-black colour produced by the addition of iodine, and (but in a still less degree) in the tint assumed on adding sulphuric acid, which was "*almost* identical with that noticed in the interior of the sections of vegetable tissue."

Such distinctions are certainly of the slightest character, particularly when considered in connexion with the minuteness of the objects investigated, their relation to surrounding matters calculated to affect the colour produced, the strength of the reagents, the length of time allowed for their operation, and the comparative estimate of the shade of colour. On this head, Virchow (op. cit., p. 257) incidentally remarks, that the degree of concentration of the reagents materially concerns the results, and that the beautiful blue colour with the solution of iodine is to be got only after a considerable period, and in practised hands.

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* Journal de la Physiologie, p. 89. 1859.

† Transactions of the Pathological Society, p. 301. 1859.

The conclusion generally arrived at is, that in these corpora amylacea of the nervous tissue, we have a peculiar chemical compound, very closely allied to starch, and not precisely analogous with the amyloid bodies found in other portions of the body. However, we shall presently see that M. Rouget contends for a glycogenic function diffused throughout the body, and that the formation of amyloid matter is a normal result of that function—a hypothesis which would refer the starch-like matter of the cerebro-spinal axis to the parallel class of substances existing elsewhere.

Another question is, whether these peculiar corpuscles are to be considered integral parts of the normal tissue or pathological products. Dr. Bristowe and Mr. Ord treat them as normal formations, but Dr. Wilks alludes to them as morbid, and, as we have seen, Virchow refers to their great multiplication in connexion with certain morbid processes. The truth probably is, that they belong to the same category as the Pacchionian bodies, and are not normal histological elements, although usually developed with advancing age.

Very nearly akin to the corpora amylacea of the nervous system, are the corpuscles found in the prostate gland of adults, which may be pressed from its follicles and detached by washing. M. Rouget has given them much attention (op. cit., p. 88), and Dr. Paulizky, of Berlin, has written a thesis upon them, since republished in Virchow's 'Archiv' (Band xvi. p. 147); but there are wide discrepancies between these two observers in the results arrived at. Paulizky represents them as exact counterparts of starch-grains—

> "Having the same concentric lamination, the same lustre, consistence, and refracting power, swelling up and dissolving in reagents in the same manner, and exhibiting the same reaction with iodine. Both agree in their chemical composition, and by fermentation are convertible into sugar. . . . . At the same time it must be admitted that all prostatic amyloid corpuscles do not behave in precisely the same manner; the coloration with iodine is liable to many modifications, and the conversion into sugar is not always practicable; for as the concretions augment in size, the starch progressively disappears, and is replaced by calcareous and colouring substances."

Hence it is only the smaller varieties to which the name of corpora amylacea is rightly applicable; the others, loaded with calcareous salts and pigment, constitute prostatic concretions, and are often visible to the naked eye.

We cannot follow Paulizky in the elaborate structural and chemical details he enters into, all combining to show the precise likeness between the corpora amylacea from the prostate and starch-grains. However, he admits that the clear blue colour with iodine is not generally obtainable, it being, as he says, modified by foreign matters about the corpuscles. Moreover, there are amyloid granules which acquire with iodine at first a copper-red hue, and afterwards a brownish-red, resembling in these particulars the starch-grains in the seed-coats of Chelidonium. Such exceptional corpuscles are intermixed among the rest, and occasionally a few are found which present concentric laminæ, alternately tinted blue and brown, or have the two colours blended until a dark violet colour results. For all such irregular bodies analogies are to be met with in admitted starch-grains. Thus Nägeli describes amylaceous grains in which starch and cellulose are combined, the latter serving as the matrix for the former. In such bodies the blue stain with iodine is the more pronounced in proportion as the starch preponderates, and *vice versâ;* when the cellulose is in excess (as in the starch of Chelidonium), the brownish-red colour is the more prominent. However, as is well known, the subsequent addition of sulphuric acid brings forth the blue colour in the previously brown cellulose globules.

The tint produced is very much modified by the quantity and the degree of concentration of the iodine solution. The smaller the quantity applied and the weaker the reagent is, so much the clearer is the blue colour developed, particularly when time is given for its operation. An excessive quantity and a strong solution produce a deep blackish colour.

The intimate association of the corpora amylacea of the brain with the surrounding tissue has hitherto proved an obstacle to their collection apart, in order to submit them to the test of conversion into sugar, which alone, to most writers, seems wanting to establish their identity with starch-grains. In the instance of the prostate, however, this same difficulty does not present itself, for its amyloid corpuscles often occur in such profusion that they may be washed from the parenchyma of the gland, and collected in sufficient quantity to be submitted to the tests for sugar. Paulizky employed Trommer's test, and succeeded also in exciting fermentation.

The origin of the amylaceous matter in the prostate is assigned to the cells of the parenchyma, the contents of which Paulizky has succeeded in some examples to stain blue with iodine. Such cells undergo a certain series of physical changes; their nucleus shrivels up, loses its granular aspect and its definite outline, and the entire cell eventually appears homogeneous and transparent, and like its nucleus, loses its definite outline.

Lastly, Paulizky states that corpora amylacea are not restricted to the prostate, but occur about the follicles of the neck of the bladder, both in men and women, and are often converted by calcareous deposit into minute calculi. He has also found them in the urethra and in the seminal vesicles of men, and within the vagina of females.

According to these researches of Paulizky, very little doubt could be entertained that the prostatic corpora amylacea and starch-grains are all but identical in nature; the most that can be said in favour of an opposite view is, the less distinctness of the colour produced in the former by reagents, and their demonstrable mixture with albuminous material. And when we refer to the evidence M. Rouget has to offer against this alliance between the two varieties of granules, we find little in it to call for a modification of the views advanced by Paulizky.

The statements, that the nucleus of the amyloid corpuscles is always central, of large bulk, and granular, whilst that of starch is a brilliant speck, and always excentric, are, as before observed, not admissible. Again, the diversity in the form of the black cross which appears in both sets of granules, being in one like a Latin, in the other like the St. Andrew's cross, is insufficient to establish a difference of nature in the two; and when M. Rouget appeals to the slight varieties of colour perceptible in prostatic granules and in starch on the application of iodine, we feel that he is not taking into sufficient account the phase of growth of the former, nor making that careful discrimination regarding the strength of the iodine solution employed, the quantity applied, and the time taken, which we have seen done by Paulizky. Likewise, when the French observer appeals to the different behaviour of prostatic corpuscles and of starch under the operation of sulphuric acid and of potassa, we perceive the same defective recognition of the very great differences prevailing in the former, according to their age and size, and are indisposed to accept his results, when contradictory, as sufficient to weigh against those of Paulizky, supported, moreover, as these last are, so strongly, by the conversion of the granules into sugar.

After all, M. Rouget differs as to ultimate results not very widely from Paulizky, or, indeed, from the majority of pathologists, for he recognises in the animal amyloid granules a sort of compound intermediate between starch and cellulose, and regards those that are coloured blue by iodine alone, and readily acted upon by sulphuric acid and the alkalies, as approaching nearest to starch, whilst the others, which become brown with iodine alone, and exhibit a powerful resistance to sulphuric acid and potash, he conceives to be most akin to cellulose. Yet along with these affinities to the amylaceous matters of plants, M. Rouget discovers indications of the mixture of azotized or animal matter in the amyloid corpuscles of the human subject—a fact to which Paulizky has also pointed in the differential reactions he has notified between the two. Upon heating the prostatic concretions (says M. Rouget), a very distinct odour of burnt horn is emitted; on applying Millon's reagent (the acid nitrate of mercury), they change to a bright red; the combined action of ammonia and of nitric acid developes the orange-yellow tint of xanthroproteic acid; and lastly, on placing them in a solution of sugar, and applying concentrated sulphuric acid, they assume a rose-colour, less pure and intense, however, than that developed under like circumstances by pure proteine substances. All the peculiarities of colour presented by the prostatic corpora amylacea under the action of reagents are partaken equally by every portion of their mass, and the assumption is, that the intermixture of the animal matter with the amylaceous is most intimate, and equivalent to a chemical combination—as much so, at least, as that of the calcareous matter of bones with their gelatine.

Besides the amylaceous corpuscles of the nervous centres and of the prostate, there are others observed by Friedreich* in the parenchyma of the lungs agreeing with them in physical conformation, and more particularly in acquiring a blue colour with a solution of iodine alone.

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* Virchow's Archiv, Band ix. p. 613.

They were found in the hepatized lungs of patients, two of whom died with typhoid fever.* Little being known of these amyloid bodies, we will content ourselves with calling attention thus far to them, with the hope of provoking further inquiry.

The three forms of amylaceous corpuscles just described may be very properly grouped together as constituting one variety of amyloid degeneration. They agree in being, as a rule, laminated, in being coloured blue by iodine only, and in being found in a more or less isolated state, though intermingled among the normal elements of the tissues. They would also appear to originate by a sort of deposition upon pre-existing histological elements—such as cells, and to grow by accretion, usually, but not invariably, of the same material; for, in the case of some prostatic amyloid concretions, the difference of colour, on the application of reagents, of different laminæ, betrays a variation in their component matter.

We now come to another group of amylaceous corpuscles, partaking of several characters in common—viz., they are neither laminated, nor coloured blue by iodine only; they combine *en masse* to produce mostly a very appreciable and tangible lesion of the tissue they infest; and instead of being concretions, are the result of an actual metamorphosis or degeneration of the normal histological elements, analogous to what occurs in the process of calcification. It is to this morbid act of the transformation of normal tissue into a substance in some respects recalling chemically that of amylaceous compounds, that the terms amyloid degeneration and amyloid infiltration are particularly applicable.

Although these terms are comparatively novel, yet the condition they represent has long been known among pathologists by various names, and particularly as "waxy," or "albuminous" degeneration, or as "colloid," and more recently as "lardaceous" or "cholesterine disease." And, as most of these older appellations indicate, the prevalent hypothesis has been, that the morbid product was of a fatty nature; indeed, there is no question that many cases of so-called scrofulous and of fatty liver have been examples of what we choose at present to call "amyloid degeneration." To Dr. Wilks we are especially indebted for an able article on the Pathology of "Lardaceous" Disease, in the 'Guy's Hospital Reports' for 1856 (vol. ii. p. 103); and in the Report of the Meeting of the Physiological Society of Edinburgh (Session 1853–54), in the 'Monthly Journal of Medical Science,' 1854 (vol. xviii. p. 186); as likewise in a paper at a subsequent page (p. 393) of the same volume, we find some excellent remarks on the pathology of "waxy degeneration," by Drs. Gairdner and Sandars, which anticipate many of the views of Virchow, as subsequently placed before the Profession in this country. However, it is to the eminent German physician just named that we are especially indebted for collecting and putting prominently forward a collection of facts which prove the frequent existence in the animal economy of a general morbid process, distinguished by the production of a peculiar chemical compound, which gradually replaces the normal elements of the affected tissues. This is the fact to which modern pathological researches point, and it really matters little, practically, whether Virchow's hypothesis of transformation into an amylaceous compound be or be not established, although it will constitute a real advance in pathology to ascertain under what conditions, in what forms, and by what symptoms the degeneration in question manifests itself.

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* Virchow's Archiv, Band ix. p. 613, and Band x. pp. 201 and 507.

The general physical characters of amyloid degeneration, when sufficiently advanced to be recognised in the altered tissue of the organ affected, are but indifferently expressed by any one of the terms formerly applied to it. The morbid structure is not lardaceous, or like lard, as that term implies on any ordinary principle of etymology; for we think no one would translate "lardaceous" to mean "like bacon-rind," as Dr. Wilks intimates, though "bacon-rind" represents many of the physical qualities presented. "Waxy" is preferable to "lardaceous;" but the actual condition mostly is, according to Dr. Wilks, as if "wax and lard" were combined :—

> "The cut surface of the affected organ has a semi-transparent appearance, presenting no structure, and feeling, when incised, like a piece of wax, or of wax and lard combined. It can thus be cut into portions of the most regular shape, with the sharpest angles and smoothest surfaces; the thinnest slice can also be taken off by the scalpel for microscopical purposes. There is little change produced in it by water or alcohol, and acids and alkalies do not effect any great alteration in it. It is thus remarkably inert, and may be kept for a great length of time without any signs of decomposition. . . . When affecting organs in too slight a degree to be recognised by the naked eye, it is seen by the microscope in the form of rounded or oval masses, like horn, presenting no structure, and quite unaffected by the application of ordinary re-agents." (Op. cit. p. 120.)

Other features of the morbid change may be enumerated; such as the increase in volume, solidity, and weight of the organ affected; anæmia, or loss of the natural colour, for the yellowish or brownish tinge perceived is nothing more than the colour of the surrounding unaltered tissue, and of the bloodvessels transmitted through the semi-transparent, though dull, morbid substance.

Slight diversities in external appearance prevail both in the same organ affected by amyloid degeneration, and in different organs, dependent on the differences in minute structure and in the precise locality of the deposition of the morbid matter. Thus, Dr. Wilks distinguishes three varieties of lardaceous disease when affecting the spleen; whilst Virchow, before him, indicated two forms, according as the degeneration affected the Malpighian corpuscles or the surrounding tissue. Of these and similar subjects relative to the pathology of the several organs most prone to the disease in question, we shall have hereafter to speak.

The history of the extension of the hypothesis of a cellulose or amyloid matter as a *materies morbi* to the pathological conditions previously comprehended under the name of waxy degeneration, is to be found in the researches of Virchow, as recorded principally in the

'Archiv für Pathologische Anatomie und Physiologie,' edited by himself. In the first place, the discovery of the corpora amylacea in the brain led him to search for starch or cellulose in every organ and tissue of the body, both in health and disease, and very soon his industry was rewarded by finding, in waxy degeneration of the spleen, the Malpighian bodies transformed into small masses resembling boiled sago grains, which produced, by the conjoined action of iodine and sulphuric acid, the violet colour of cellulose. The corpuscles so coloured, however, were not laminated like those from the brain; and although, from their resistance to decomposition, he was able to collect a considerable quantity by washing the macerated spleen, yet he could not succeed in confirming his opinion of their starch-like constitution, by converting them into sugar.

These researches were made in 1854, and early in the following year he was able to enlarge his list of tissues liable to what he then called "cellulose degeneration," and gave the following abstract of his experiments:

> "Cellulose degeneration has been found:—
>
> "1. In the nervous system; ligamentum spirale cochleæ, and atrophied parts of the brain and spinal cord; in gelatinous and cellular softening.
>
> "2. In the spleen: in the follicular cells and pulp; in the thickened walls of its arteries in all stages, and in the trabeculæ.
>
> "3. In the liver: the cells in the peculiar waxy degeneration of the organ, and in the intercellular tissue.
>
> "4. In the kidneys: in these the amyloid condition is very frequent, and the change mostly begins in the Malpighian tufts and their afferent vessels, the walls of which are enormously thickened and infiltrated with the amylaceous substance. Next in frequency to the vessels, the areolar tissue in the vicinity of the papillary ducts is most affected."

This list was rapidly extended, and at the present day there is scarcely an organ or tissue of the body, excepting the osseous, which has not been found affected by amyloid degeneration. The muscular system is little prone to the change, but it has been met with both in the heart and uterus. It seems to be found wherever there is connective tissue, and in connexion with this it is seen extensively distributed in the submucous coat of the alimentary canal, occasionally in its whole length.

Cases of unusually wide distribution of the disease are recorded by Virchow,[*] and by Dr. Otto Beckmann;[†] but the most remarkable example of complete degeneration of the tissue of an organ into the wax-like matter is recorded by Friedreich and Kekulé.[‡] It occurred in a patient who had suffered from tertian ague for a year, and at length became dropsical and much emaciated. Diarrhœa frequently recurred; the liver was apparently not enlarged, but the spleen was felt to be twice its natural size; the lower part of both lungs was dull; there was systolic murmur of the heart, but no hypertrophy; the urine high coloured, specific gravity 1019, and contained albumen. A post-mortem examination displayed double hydrothorax, com-

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[*] Archiv, Band xi. p. 188. [†] Ibid., Band xiii. p. 94. [‡] Ibid., Band xvi. p. 50. 1859.

pressing the lower segment of each lung; a small, contracted heart, having its walls degenerated into a bacon-rind-like substance; the liver shrunk; capsule thickened in several places, and puckered, and connected with several rounded, circumscribed, yellowish-white masses, varying from the size of a pea to that of a bean, consisting of fibrous tissue undergoing fatty degeneration. These masses were more or less embedded in the parenchyma, yet they were productive of much irregularity of the surface of the liver. The greatly enlarged spleen had a waxy hardness, and all the appearances of amyloid disease in an intense degree. A large portion could be distinguished through the capsule of a greyish white hue, which on section proved quite bloodless, of irregular outline, not precisely circumscribed; white at its middle, and of a greyish-white externally, and having the exact consistence of white wax. The surrounding tissue into which this white material shaded off, was of a pale red colour, as in the usual examples of waxy spleen.

A microscopical examination of the white central mass showed a homogeneous substance, wherein none of the histological elements of the spleen were traceable, but which presented very distinctly the blue reaction with iodine and sulphuric acid. Here and there, indeed, in the mass were a few small particles of tissue and of bloodvessels which did not exhibit the reaction. The appearance of the white substance was seemingly due to a white granular fat diffused through the amyloid material, and derived from fatty degeneration of the corpuscles of areolar tissue, or of the trabeculæ of the spleen, the ground substance of the areolar tissue being itself converted into the amyloid matter.

The amyloid degeneration was moreover found in other organs of the body, in the kidneys, the vessels and lining membrane of the uterus, and in the pericardium, in the submucous tissue of the jejunum and colon producing a thickening of the walls at parts, and in a less degree in that of the stomach, and lastly, in the capillary network of the intestinal villi.

Except in the permanent cartilages, says Virchow, amyloid degeneration has not been met with as a strictly local lesion; and such instances have occurred only in old people; in these the intervertebral cartilages and those about the pelvis are more particularly subject to it. The rule is, that this peculiar diseased condition is widely distributed, and especially affects the spleen, kidneys, and liver. Latterly the lymphatic glands have been proved to be its frequent seat, and probably, if its effects on the intestines were more evident to the naked eye, or if a minute examination of their coats were more often made, those organs would be found not less seldom affected.

This wide diffusion of the diseased matter led to the opinion that amyloid degeneration is a constitutional malady or a general dyscrasia; but Billroth cites a case wherein the amyloid change did not extend beyond the axillary glands on one side, which were, moreover, in close contiguity with a local disease—viz., caries of the head of the humerus. The progress of the degenerative changes has been followed by Virchow, and his results agree with those of other observers. He finds the small vessels, the capillary arteries in particular, to be the first structures attacked. This fact may be well seen in the capillary network of the submucous and subserous tissue of the alimentary canal, and in that of the villi. The walls of the vessels become granular and thickened, and a reduction of the calibre is the result. When the nutrient arteries of the tissue are thus encroached upon, the parenchyma supplied is soon involved in the morbid process. The nutritive mechanism being thus the first to suffer, there is a natural tendency in the degenerative changes to spread. A more minute investigation proves that it is the middle or muscular coat of the arteries which first is changed; each fibre cell becomes compact and homogeneous, and its outline indistinct; its nucleus vanishes, and at last nought except a spindle-shaped particle, uniform in composition, remains distinguishable. When this cellular transformation of its coats is completed, the artery looks like a homogeneous and compact cord or mass, which by reflected light presents a sort of lustre; is colourless and readily broken down, but not hard and brittle like a calcareous vessel.

It is interesting to follow the changes in the liver, where each advance of the degeneration becomes revealed by means of the peculiar structural formation of the viscus. For at first, the degeneration attacks the branches of the hepatic artery, and when it has established itself in an acinus, three zones, varying in colour and appearance, become perceptible; the outermost occupied by the portal vessels and the seat of fatty degeneration, the central by the hepatic vein marked by pigment infiltration, whilst the intermediate zone is the site of the amyloid deposit. After the arteries are degenerated, the secreting cells about them become involved, acquire a homogeneous aspect, lose their nuclei and cell-wall, and at last take on the form of ill-defined, glistening masses of a uniform consistence. They are in this manner transformed into amylaceous corpuscles, but without lamination.

Dr. Wilks has noted the striking disposition of the parts affected relative to those around them,* and has well described the general appearances of the amyloid, or as he calls it, the "lardaceous" liver. When it exists in an extreme degree, the altered tissue appears homogeneous and translucent, and the few bloodvessels discoverable in it emit only a little watery blood:

> "In a less degree of disease, such as is generally found towards the circumference of the viscus, the lobules are mapped out in a remarkably clear and defined manner; in fact, in no disease of the liver is the appearance of lobules (which, as a rule, are not marked) so distinct as in this particular morbid condition. This is caused by the lardaceous material being deposited within the lobule, in and among the secreting cells, causing it to appear as a distinct transparent body, and made more definite often by a slight fatty degeneration of its margin; for this fat, being mixed with the lardaceous matter, produces an opaque white material, which passes completely around and amongst the lobules, mapping them out in the most perfect manner. Towards the edge of a lardaceous liver, therefore, this appearance is generally seen—a dead white opaque matter running in the course of the portal vessels, and between these the transparent lobules themselves, with the hepatic vein in the centre. Fat is no essential element of the disease, for the most extreme instances do not con-

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* Guy's Hospital Reports, p. 128. 1856.

tain it, except, it may be, towards the circumference of the organ, as already stated. In cases of phthisis, however, we often see the two co-existing."

The differences between fatty and amyloid degeneration of the liver are very clearly stated by Dr. Gairdner, and were made the subject of a special paper published conjointly by him and Dr. James Drummond.* The latter physician made seven analyses, and the summary is, that—

"Fatty liver consists of precisely the same elements as the normal liver, in a similar structural arrangement. The aggregate of solids and water may be slightly increased or slightly diminished; their per-centage, however, is invariably considerably reduced, owing to the enormous development of oil in the glandular cells, by which the volume of the organ, as well as its weight, may be almost indefinitely increased.

"The waxy liver is a true degeneration; for this condition is not like the fatty liver, due merely to a morbid increase of one of the non-essential elements of the organ, but to a metamorphosis of its most essential—i.e., its glandular structure, into a much more dense albuminous material than in the normal condition; a change which results in total destruction of the function, as well as the structural characteristics of the gland-cells, and in a great increase of the solids of the organ at the expense of the fluids, the blood ceasing to circulate freely, and the water being diminished from three-fourths to three-fifths, or possibly in some cases to one-half of the weight; the solids being correspondingly increased, the fat either increased or unchanged.

"Cirrhosis of the liver is either an independent degeneration, or it may spring from the waxy or the fatty conditions. In the former case it assumes at once the atrophic form, and all the elements may simultaneously disappear; the atrophy commencing, however, in the glandular epithelium, and thus giving rise to an apparent relative hypertrophy of the fibrous tissue. . . . . In other instances, cirrhosis is a complex lesion, and, especially when the liver has been greatly enlarged, it participates largely in the chemical characters of the waxy or fatty liver.

"Finally, the waxy and the fatty liver are not unfrequently met with as a combined lesion. In such cases the liver is usually very much enlarged, dense and opaque yellow on section; intermediate in specific gravity between the two typical forms of disease, and therefore approaching the normal density, and it presents under the microscope a degenerated epithelium, and very numerous but unusually small fatty granules and globules."

The following table is appended to this summary, and is valuable for the facts it displays:—

"*Empirical formulæ representing the chemical constitution of the entire liver in health and in various pathological conditions (avoirdupois weight).*

	Normal liver.		Fatty liver.		Waxy liver.		Cirrhosis with hypertrophy.		Cirrhosis with atrophy.	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Water . . .	3	0	2	8	3	6½	4	2	1	6
Solids . . .	0	15	1	0	2	0	1	3	0	7½
Fat	0	1	1	8	0	2½	0	5	0	2½
Total weight	4	0	5	0	5	9	5	10	2	0

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* Monthly Journal of Medical Science, vol. xviii. p. 126 and p. 392.

But perhaps amyloid degeneration of the kidneys may awaken the most interest, inasmuch as it is now admitted to constitute one of the varieties of Bright's disease. Here in these organs, as elsewhere, the degeneration is first seen about the capillary arteries—viz., the Malpighian tufts and their afferent vessels, and after it has advanced to a certain point, the injection of the cortical substance becomes impracticable, for the arteries are rendered impervious to the particles of the injection by the deposit of the foreign substance in and upon their walls. Subsequently, the Malpighian corpuscles are converted into apparently solid, homogeneous granules, and the extension of the disease to surrounding parts produces at length the condition known as waxy kidney.

Dr. Gairdner, in 1853,[*] recognised the connexion of waxy degeneration of the kidneys with that of the spleen, and correctly described the arteries and Malpighian tufts of the renal organs as "the first portions distinctly affected. It is further remarked (p. 188), that Drs. Gairdner and Sandars had made repeated observations on the point, and arrived at the conclusion that the waxy conditions of the liver and kidney depend on the same change as that which takes place in the spleen, are of the same nature, and not dependent on fatty degeneration, but, as Dr. Gairdner expresses it, on "a peculiar modification of the protein compounds, in virtue of which they approached the character, and possibly the chemical constitution, of keratin, and presented a much greater resistance than in the normal state to acid and alkaline solvents."

These references are interesting in an inquiry relative to the development of the prevailing views on waxy degeneration, and are due to our fellow-countrymen, who evidently had, if not prior to, at least independently of Virchow, taken the first steps towards the elucidation of the peculiar degeneration in question. But to return to our descriptive details.

Of the appearance of this kidney lesion, Dr. Wilks gives the following excellent account:

> "In advanced states, the organ, when removed from the body, might be mistaken at first sight for a specimen of the large white kidney of Bright; but a little more minute examination will show the difference between them. The organ is considerably harder than the Bright's kidney, and instead of being easily lacerable, is remarkably firm and tough; the surface is uniform and smooth, and presents no mottling or white deposit discoverable by the eye; the cortical structure is seen to be much increased in extent, and this causes the whole organ to appear as if composed of one uniform albuminous substance (except where the apices of the cones appear), giving it a semi-transparent appearance and a leathery consistence. These extreme cases are, however, seldom met with; . . . the more common form of the disease is a less or partial degree of it, and associated with a similar affection of the liver and kidneys, and met with, like them, in connexion with necrosis of bone. The translucency, hardness, and uniformity of the surface is often sufficient to identify it; if present to any extent, but if in a less degree, the aid of the microscope is required to detect the presence of the disease. If a thin slice of the affected organ be taken, this instrument will at once discover the

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[*] Monthly Journal of Medical Science, vol. xviii. p. 186.

alteration by the peculiarity of the Malpighian corpuscles; these appearing by transmitted light as round, transparent bodies, having a glistening aspect, and thus producing a resemblance to the spleen when the subject of the same disease. If the capsule be torn off, the lardaceous material will be seen surrounding and enveloping the capillary vessels composing the Malpighian tufts, and also the smaller arteries going to form them. If iodine be added to such a section, the Malpighian corpuscles will be seen to imbibe the colouring matter, and appear as bright red, glistening bodies, set in the ordinary structure of the kidney."*

In the above extract Dr. Wilks contrasts the morbid appearances of a kidney in a state of amyloid degeneration with those of one suffering from Bright's disease. But, as remarked on introducing this degeneration of the kidney to notice, it is to be considered one form of renal disease, attended by that peculiar group of symptoms which is known as Bright's disease; for Bright's disease is not represented by one special lesion, but by several morbid conditions of the kidney. Virchow distinguishes three such conditions—viz., 1, Parenchymatous nephritis, an inflammatory condition, involving especially the tubules and their epithelium, leaving the Malpighian corpuscles intact, or almost so; 2, Amyloid degeneration, in which those vascular corpuscles are primarily affected; and 3, A lesion of the interstitial substance, inducing some sort of deposit, involving pressure upon the Malpighian corpuscles and uriniferous canals.

In a preceding page we have cited a remarkable example of extreme amyloid degeneration of the spleen, and it may be asserted of this organ, that of all the viscera and tissues of the human body, it is comparatively the most frequently affected by this lesion. Virchow, as already noticed, discovered amyloid degeneration for the first time in the Malpighian corpuscles of the spleen; but he afterwards found it affecting the surrounding tissue and trabeculæ, leaving the corpuscles intact. Thus two forms of amyloid degeneration of that organ were indicated, distinct, at least, in their developmental history, although in very advanced cases all the histological elements become involved. Dr. Wilks, on the other hand, distinguishes three varieties, the first of which offers most distinctly peculiar characteristics of the disease. It is marked by the transformation of the Malpighian corpuscles into round, translucent bodies—the sago-like granules described by Virchow.

"In the most extreme cases, they never occupy more than about half the bulk of the organ; the intervening pulp-structure being healthy. The spleen, as a whole, is generally enlarged, though not very much so, and therefore no indication may exist externally of the disease within. In consistence, the organ is hard, but not more so than is witnessed in some forms of heart disease. Even when a section is made, the alteration of structure might be very readily overlooked, and no doubt often is so; but after being exposed to the air for some time, the distinction in colour between the adventitious matter and the natural splenic structure becomes very evident. . . . The material (amyloid) itself, both to the naked eye and to the microscope, presents the same appearance as that found in the liver.

"The second form of the disease is where a peculiar translucent substance pervades the organ in all parts, giving the appearance as if a quantity of melted tallow had been poured into its cellular structure. This matter appears identical in all respects with that before mentioned; but, instead of affecting the splenic corpuscles by a slow transformation, is poured out into the substance of the organ in a more ill-defined and rapid manner. . . . Besides the mere outward similarity of the disease to the ordinary form, its association with tuberculosis, and with a peculiar enlargement of the lymphatic glands sometimes found co-existing with lardaceous disease, is another reason to suppose the two allied.

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* Guy's Hospital Reports, p. 127. 1856.

"The third form of the disease bears some relation to those previously spoken of; but its precise connexion with them has to be discovered. Its tie of relationship is not only through its own similarity of composition, but through tuberculosis and the peculiar enlargement of the lymphatic glands which are sometimes found with lardaceous viscera. The spleen in this form is seen to be pervaded by a whitish-yellow, opaque, soft material, in distinct masses of an irregular shape, and not occupying any particular portion of the organ, or running throughout it in continuous lines, as in the former cases. It resembles in appearance the mixture of lardaceous material and fat, . . . as often seen between the lobules upon the margin of the liver. This disease has been sometimes indiscriminately called tuberculous; but the adventitious substance differs considerably from true miliary tubercle in the spleen, although it resembles very closely the soft yellow strumous material found in this organ, and with which it is possible it may be identical. The great interest of the affection is its being associated with an enlargement of the lymphatic glands, producing an obscure but fatal disorder."

If the reaction with iodine be admitted as a decisive distinction between amyloid and other infiltrated matter in the spleen or elsewhere, the observations of Dr. Harris* would throw a doubt upon the correctness of admitting the third form of splenic degeneration mentioned as one of the amyloid series; for this variety appears distinctly referred to in the following extract from his valuable *brochure,* together with another morbid change in the Malpighian corpuscles of the spleen, in which the usual reaction with iodine does not transpire. We place the extract before our readers without comment, that its statements may be tested by further experiment:

"Two, if not more, very different pathological states have been confounded together under the name of waxy degeneration. Not infrequently the Malpighian bodies of the spleen are seen enlarged, forming small, round, white bodies, varying in size from a pin's head to a hemp-seed; these are not so semi-transparent, not so sago-like, as the amyloid degenerated corpuscles. Occasionally, too, the spleen is found occupied by numerous largish opaque white, or whitish yellow, irregularly-shaped, hardish masses. In two cases which have recently come under my observation, this condition of the spleen was associated with great general enlargement of the lymphatic glands; both of these cases were boys of the ages of eight and twelve respectively; in one there was a considerable increase of the white corpuscles of the blood; in the other, the blood, owing to an accident, was not examined. In neither case was any change of colour in the affected organs perceptible on the addition of iodine."

Dr. Wilks, before concluding his paper, recounts the interesting fact, that the amyloid spleen arrested the attention of Drs. Bright and Hodgkin many years since, and that they recognised the frequent association of similarly diseased lymphatic glands with it. Dr. Bright refers* to the circumstance as having been originally pointed out by Dr. Hodgkin, and Dr. Wilks has made out that the record of it occurs in the seventeenth volume of the 'Medico-Chirurgical Transactions.'

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* On the Nature of the Substance found in Amyloid Degeneration, p. 21.

It is due to Dr. Sandars† to make a reference to his early description of waxy spleen, which contains an accurate outline of its general aspect and its microscopical appearances, and particularly makes mention of that alteration of the Malpighian corpuscles which the German pathologists likened to sago grains. The prevalence of this lesion of the spleen is prominently stated by Dr. Sandars; for although generally overlooked, he found it in a more or less advanced stage "in a large proportion (about ten per cent.) of the bodies examined at the Royal Infirmary, and usually associated with the waxy liver and kidney in certain forms of Bright's disease and tubercular phthisis."

The implication of the lymphatic glands in amyloid degeneration, so sagaciously detected by our English pathologists, has been amply demonstrated not only by Dr. Wilks, as above quoted, but also by Virchow, Billroth, and others; and we may hope, now that this point in pathology is so distinctly put forward, to get at the interpretation of many ambiguous cases where marasmus, anæmia, and dropsy have constituted primary symptoms, yet not attributable to any evident lesions of those organs to which we are accustomed to refer the production of such pathological phenomena.

When amyloid degeneration invades the lymphatic glands, it pursues the same course as in the spleen, and either attacks pre-eminently the small arteries, or otherwise the finely cellular substance which occupies the follicles. In the latter case, the follicular cells are converted into corpora amylacea, which, on a section of the gland, appear like little globules of wax, and acquire a red colour when brushed over with iodine, whilst the normal tissue around remains yellow.

Dr. Wilks, it should be stated, speaks rather doubtfully of the enlarged lymphatic glands he has met with being affected in precisely the same manner as the lardaceous or amyloid spleen. However, both Virchow and Billroth treat of amyloid degeneration of the lymphatic glands as an unquestionable pathological fact, and if the third form of spleen degeneration which Dr. Wilks has described be admitted within the amyloid series, then the lesion of the lymphatics he has also portrayed as being closely connected with it, must also be included.

The general appearances of this enlargement of the lymphatic glands, and the collateral conditions, are thus narrated by Dr. Wilks (op. cit. p. 129):

> "The enlargement of the glands is in most cases gradual, extending sometimes over a period of two, three, or more years, and often, from commencing in the neck of weakly children, is called scrofulous. When the mischief is thus gradual in its commencement, and affecting only part of the glandular system, no marked symptoms ensue, but as time tends to its development in

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* Guy's Hospital Reports, First Series, vol. iii.

† Monthly Journal of Medical Science, p. 187. 1854.

the thoracic and abdominal glands, a slow prostration ensues, terminating in death. The glands often reach an enormous size—much larger than when affected with scrofula. When felt during life, in their early progress, they are recognised by their peculiar elastic feel, differing both from the early hardness or the subsequent softness of scrofulous glands, and also differing from these (as far as our experience goes) by being quite unaffected by iodine. In fatal cases they have been found not only forming large tumours in the neck and groin, but accompanying the aorta its whole length, and thus affecting all the posterior mediastinal and lumbar glands, occasionally even following the arch of the aorta to the anterior mediastinum. Sometimes, however, none of the external glands have been affected, and the existence of glandular enlargement has not been known until after death."

These glandular tumours are easily separable from each other, and have on section a yellowish colour and a soft translucent aspect.

"Upon squeezing or attempting to tear them, however, this softness is found to be an illusion, as they are remarkably tough, and emit no juice, but only a little serous fluid. Upon cutting off a small portion and endeavouring to separate it by needles, it is found to have almost a leathery consistence. The cut surface of the gland is quite uniform, ... though sometimes they contain small masses of dead material in the centre."

A microscopical examination shows the normal glandular elements to be replaced by a fibro-nucleated tissue, with sometimes in addition an amorphous material, "particularly in those cases where lardaceous disease has elsewhere existed; and this is another reason to warrant the opinion that the two affections are closely allied."

The history of the cases of this peculiar lymphatic enlargement recorded by Dr. Wilks, shows its not infrequent association with tuberculosis; at the same time, it is no necessary concomitant of this pathological state. It is, as Dr. Wilks remarks, an affection "not yet recognised under the ordinary forms of disease;" the source of a fatal cachexia, and the symptoms of which are "only those of anæmia, prostration, and final exhaustion." He adds:

"In what measure the lymphatic glands and spleen relatively participate in producing this result, we will not venture to say, although sufficient is known of the functions of both organs to be assured that disease in either will lead to severe derangements of the system, and moreover, connected as they are with the blood-making process, that if a slow destruction of their structure goes on, so a gradual death of the patient will as assuredly ensue."

In the same way Virchow connects amyloid degeneration of the lymphatic glands with general wasting, and with a tendency to dropsy, from the impediment created to the process of absorption, whilst he further finds in the diseased glands the cause of anæmia, by reason of the destruction of their follicular cells, accompanied as this usually is by a similar lesion in the spleen.

Next in frequency to degeneration of the spleen, liver, kidneys, and lymphatic glands, is that of the intestines, where the amyloid matter is deposited in the vessels of the submucous tissue, and particularly in the villi. It leads to anæmia of the mucous membrane, with some swelling or thickening. Friedreich describes a peculiar glistening aspect of the mucous membrane in the case he details at length,* and the presence of pale, anæmic swellings at several parts of the large intestines, but these growths were only doubtfully of an amyloid nature.

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* Virchow's Archiv, p. 54. 1859.

It will be seen, therefore, that amyloid infiltration in the tissues of the intestines has few characters to attract attention: pallor or anæmia is indeed the only one likely to do so. To discover the existence of this disease with certainty, therefore, the application of reagents and the use of the microscope must be called into requisition. The latter reveals at once the presence of the foreign matter, particularly about the small vessels, whilst the application of iodine will make manifest the points affected to the naked eye. The employment of chemical reagents was successfully applied by Dr. Harris in detecting the presence of amyloid in the pale but otherwise natural-looking walls of the intestines in his first recorded case. He says:

> "On brushing a solution of iodine over the mucous membrane of the intestines, innumerable little dark-red points, corresponding with the villi, appeared, and on placing on the part thus changed a drop of dilute sulphuric acid, the whole surface previously coloured by the iodine changed to a bluish-steel colour."

Amyloid disease in other organs has not been found sufficiently extensive to constitute the principal lesion, or to entitle it to particular notice on the present occasion; yet the presence of amyloid corpuscles in organs and tissues often undergoing other pathological changes, renders it most desirable to determine the relations and conditions under which this amyloid infiltration may subsist.

As a general conclusion, we may reiterate what has been more or less distinctly stated before, that in amyloid degeneration we have a new general pathological fact, a newly-remarked constitutional disease, distinguished by certain chemical and physical characters from every other morbid condition. The chemical characteristics are easily recognised, notwithstanding the prevalence of different opinions respecting the substance they are supposed to identify, and the physical characters are conclusive, whether derived from the extent of the degeneration causing most evident alteration of structure, or from its prevalence in a lesser degree, requiring the aid of the microscope to certify its presence. It is a lesion evidently of nutrition; there is an alteration in the plasma of the parts affected, which, as a rule, becomes first manifested about the arterial capillaries, whence the supply and interchange of nutrient matters proceed, and by degrees the normal histological elements lose their distinctive features, and become transformed into amyloid bodies; and when once the normal nutrition of a part is interrupted, the degeneration has a natural tendency to extend and involve contiguous tissue, whilst from its origin in, or its particular connexion with the vessels, it becomes soon fatal to the necessary nutritive acts and to the special functions of the organ it affects. Lastly, it has particular relations with other morbid conditions, but all referable to a class of which the prominent character is, that they produce or else consist in a cachectic or broken-down state of the bodily powers.

These related diseases just alluded to require a brief consideration. To enumerate them, they are—diseases of the bones, phthisis, and syphilis. The connexion of amyloid degeneration with diseases of the osseous system, was the first to arrest the attention of Virchow. In his Archiv for 1855 (vol. viii. p. 364), he remarks that all the cases of waxy spleen he had then met with were connected with disease of the osseous system, principally with caries and necrosis. This observation led him to speculate on the cause, and whether the osseous disease exercised a determining influence on the production of amyloid degeneration of the spleen, liver, and kidneys? If this were the case, the inquiry suggested itself, whether the bone disease so affected nutrition that the amyloid degeneration was a consequence? or whether the amyloid matter originated in the diseased bone, and was then transferred to the other organs? In the former case a peculiar metamorphosis consequent on an idiopathic lesion of the elements of the spleen or other viscera was implied; whilst in the second case, a metastasis was to be presumed in which the glandular organs were alone affected. His conclusion was, that the hypothesis of metastasis was the more probable, and agreed besides with that of the metastasis of calcareous matter. However, since this opinion was promulgated, researches have been largely multiplied both by Virchow and others, and amyloid degeneration has been found associated as frequently with tuberculosis and syphilis as with bone disease. Moreover, Virchow has failed to discover amyloid matter in osseous tissue.

In several of the cases of amyloid degeneration adduced by this distinguished pathologist, the tubercular was conjoined with bone disease; an association, particularly commented upon by Dr. Bennett, of Edinburgh, was that of phthisis and the production of amyloid matter. So long ago as 1853, Dr. Gairdner* remarked that waxy liver "was found to be the source of a large proportion of the cases of hypertrophy of that organ; it was common in scrofulous, syphilitic, and other chronic, exhausting organic diseases. In phthisis it is the most common of all the types of diseased liver, —far more common than the fatty liver, but often, indeed, occurring along with that condition—while in other cases no fatty matter was to be found." The reporter goes on to narrate Dr. Gairdner's remarks, which subsequent researches have so well confirmed, that the two forms of disease had often been confounded by authors; that Rokitansky looked upon the waxy material as a distinct deposit allied to fat, and that Louis had evidently confounded the two conditions under the one appellation of fatty liver. Yet, added Dr. Gairdner, "it is certainly not fat;" and his belief was, "that most of the extreme instances of hypertrophy of the liver were due to the waxy degeneration, simple or combined with fatty infiltration, for the fatty infiltration alone might exist in a very exaggerated degree without much hypertrophy. Further, in the purely fatty degeneration the specific gravity was not raised, but reduced; he had seen it as low as 1005." At the same meeting Dr.

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* Monthly Journal, vol. xviii. p. 186. 1854.

Sandars pointed out this same frequent association of waxy degeneration and phthisis.

The connexion of the amyloid disease with syphilis has been frequently noted by the German pathologists, and Pagenstecher gives the following summary to illustrate the relative frequency of amyloid degeneration in company with other pathological conditions. He collected in all, from different authors, 31 cases of this degeneration, and found it to have been associated in 10 cases with disease of bone, in 1 with arthritis, in 4 with tubercle of the lungs, in 6 with marasmus and cachexia, without disease of the osseous system, in 8 with constitutional syphilis, and in 2 it was present without attendant morbus Brightii.

Dr. Wilks recounts 14 cases of "lardaceous disease connected with caries and necrosis of bone," met with by himself and two others, of which specimens were preserved in the Museum of Guy's Hospital. Again, he describes (from the case books) 9 in which the disease was connected with syphilis and rheumatism, besides 2 from the museum catalogue; 6 of lardaceous disease occurring with phthisis; 4 of enlarged lymphatic glands associated "with lardaceous and tuberculous affections;" and 6 of a similar condition "connected with a peculiar disease of the spleen, and which appear to constitute a special form of malady." The peculiar disease of the spleen and lymphatics referred to is that before described as the third variety of "lardaceous disease of the spleen."

Sometimes Bright's disease has been spoken of as associated with amyloid degeneration, displayed either in the kidneys or in the liver, or in both together. But, as we have above remarked, Bright's disease is itself only the manifestation of the degeneration as affecting the kidneys; or, in other words, it is only one part of a general diseased condition. Such cases, therefore, are more correctly regarded as instances of simple amyloid degeneration. Two such are described by Dr. Wilks, and the six mentioned by Pagenstecher, of which the only complications recorded are marasmus and cachexia, may be referred to the same category.

There is evidence, therefore, that amyloid degeneration may occur as a primary condition; that if it involves the kidneys, it gives rise to the symptoms of Bright's disease; but if it affects the spleen and lymphatics, it produces marasmus, anæmia, and more or less dropsy. Lastly, it would seem that when it attacks the liver, it is not as a primary malady, but as a morbid condition associated with other lesions, and particularly with phthisis.

The questions that now remain for solution are, what is the peculiar substance which constitutes the element of amyloid degeneration, and what are its chemical affinities with other matters found in the human frame? In other words, is it a member of the amylaceous series of compounds, an ally of starch, or of cellulose; and if so, how is such a non-nitrogenous matter produced, and what are its relations with the ordinary animal products?

PART SECOND.

Bibliographical Record.

ART. I.—*Diseases of the Heart, their Pathology, Diagnosis, and Treatment.* By W. O. MARKHAM, M.D., Fellow of the Royal College of Physicians, Physician to St. Mary's Hospital, and Lecturer on Physiology and Pathology at St. Mary's Hospital, &c. Second Edition.—*London*, 1860. pp. 276.

DR. MARKHAM's volume comes before us in a new form, having attained the honours of a second edition. Much that was contained in the first edition has disappeared, and greatly, we think, to the advantage of the work. The preface is reduced from twenty to ten pages, and the whole introductory chapter, which amounted to twenty-two pages, has been withdrawn. The work, though smaller in bulk than the first edition, contains a larger amount of information than its predecessor, and is in every way much improved. The body of the work contains a new chapter upon fibrinous clots, and a new chapter upon functional disorders of the heart. Three appendices are also added, which treat of venesection, of fibrous arterial clots, and of the sounds of the heart.

In the chapter on fibrinous clots in the heart we find a good description of the symptoms they produce. Dr. Markham says:

> "The symptoms depending upon the formation of clots in the heart differ according to the situation of the clots. When they obstruct the circulation through the right side of the heart, the return of blood from the systemic veins is prevented; the blood does not pass to the lungs for aëration, and consequently arterial blood is not supplied to the different organs. Death consequently results in such case, rather from syncope than from asphyxia. There is also something very remarkable in the extremely painful 'cardiac' kind of dyspnœa which attends this affection; it differs from all ordinary kinds of impeded respiration. The formation of the clot in the left side is indicated chiefly by signs of extreme congestion of the lungs—of ordinary congestion of the lungs, expectoration of mucus, and bloody frothy mucus. In this case, if the patient dies, it is rather from coma than from syncope." (p. 76.)

Dr. Markham is of the generally accepted opinion that there are no pathognomonic physical signs of clots in the heart. He believes that it may be fairly concluded that a clot has formed in the heart when, in addition to the symptoms above enumerated, a cardiac murmur is suddenly developed without the usual signs of endocarditis.

The chapter upon functional disorders of the heart is well written, but it contains little that is new to the profession. Upon the subject of palpitations, Dr. Markham makes the following sensible observations. They

> "Present themselves to us in association with a series of obscure and often painful symptoms, causing to the subject of them both great mental anxiety as well as bodily suffering. Evidently their original source is to be found in the exigencies required by the artificial state of society in which men are now-a-days called upon to play their part in large cities and elsewhere." (p. 222.)

The work of Dr. Markham evinces ability; but much of his reasoning is discursive, and his arguments are sometimes over-strongly stated. He takes an unduly low estimate of the progress and state of medical science, yet in some few places he speaks of its having attained great exactitude. The descriptions of pericarditis, endocarditis, the defects of the valves, hypertrophy and dilatation, are exceedingly good. So also we would point to his account of fatty heart as a good *résumé* of our knowledge on the subject.

We shall be glad to welcome further contributions from Dr. Markham to the literature of cardiac pathology; in the mean time, we may confidently recommend the second edition of his work on the heart as containing a sound exposition of the subject upon which it treats, and urge its perusal upon those who seek information upon this important branch of the healing art.

ART. II.—1. *Exposition of a Method of Preserving Vaccine Lymph Fluid and Active, with Hints for the more Efficient Performance of Public Vaccination.* By WILLIAM HUSBAND, M.D., Fellow of the Royal College of Surgeons of Edinburgh, and one of the Medical Officers of the Royal Public Dispensary and Vaccine Institution, Edinburgh.—*London*, 1860. 12mo, pp. 45.

2. *Small-pox and Vaccination, Historically and Medically Considered: an Inquiry into the Causes of the Recent Increase of Small-pox, and the Means for its Prevention.* By ALFRED COLLINSON, M.D.—*London*, 1860. 8vo, pp. 85.

THE very decided increase in the occurrence of small-pox during the last two or three years, has been the occasion of directing professional attention more strongly than usual to the means we possess for its prevention. Among a considerable number of contributions upon this subject which have reached us, and possessing claims to something more than a mere ephemeral notice, are the two *brochures* the titles of which appear above. We congratulate Dr. Husband on the strong good sense displayed in his pamphlet, and appreciating to the fullest extent the importance of the subject which he discusses, we also admire the earnest manner in which his views are enforced. This gentleman has indeed for several years been well known in the North to have directed a great deal of time and attention to the discovery of the best means of preserving vaccine lymph. What he states is therefore, we submit, entitled to the highest consideration and respect. When Mr. Ceely, of Aylesbury, whose name is so extensively known in connexion with vaccination, visited Edinburgh during the course of last summer, deputed by her Majesty's Privy Council to make an extended inquiry into the mode of vaccination practised in that city, there were many who rejoiced in the somewhat public testimony borne to the assiduity and devotion of a professional brother when that gentleman placed himself more particularly in correspondence with Dr. Husband. The method of preserving vaccine lymph which has proved so eminently successful in the hands of Dr. Husband and of many other medical men, as fully to justify the conclusion that it is the *best* known means for the purpose, is by capillary tubes. Were this means, now generally, we think we may almost say entirely adopted in Edinburgh, as extensively employed in other parts of the country, Dr. Husband believes—and this, indeed, it is the design of his little work to exhibit—that the practice of vaccination would be thereby greatly facilitated, while by rendering vaccine lymph plentiful everywhere, the mortality of small-pox would be abated by that amount of it which is occasioned by the scarcity of lymph. The author furnishes a brief history of the discovery of his method. He started, in 1846, with some experiments in order to determine the most effectual means of keeping up a supply of vaccine matter for his own use. The squares of glass so long in use failed, and were discarded by him, and in their turn also the thermometer-shaped tubes. He then hit upon the plan of getting rid of the terminal bulb, and of diminishing the calibre and thickness of wall of the stem. There thus resulted a truly capillary tube, about three inches long, cylindrical, open at both ends, and admitting of being charged and sealed with ease and expedition. From the spring of 1847, when these tubes were for the first time made and used by Dr. Husband, down to the present hour, he has employed them in his extensive practice of vaccination, finding it facilitated thereby to a degree of which he could previously have formed no conception. In all this Dr. Husband has the merit of a discoverer; honestly, indeed, he does not attempt to conceal the fact that tubes were previously used, but he distinctly shows that the tubes of M. Bretonneau (1823), and those also of Mr. Giraud, of Feversham (as early as 1803), differed remarkably in appearance from the capillary tubes he was the first to employ. In no particular, however, have these tubes differed more remarkably than in this, that they were respectively speedily abandoned as useless, whereas the thorough adaptation of the capillary tubes is now placed beyond all doubt. The following requirements are essential in the capillary tubes: 1. They must be of such tenacity as to be sealed instantaneously at the flame of a candle. 2. They must be large enough to contain as much lymph as is sufficient for one vaccination. 3. They must be long enough to admit of both ends being sealed hermetically, without subjecting the charge to the heat of the flame; and 4. They must be strong enough not to break easily in the mere handling. We cannot follow Dr. Husband further in his interesting exposition, but we counsel our readers to obtain, for the small sum of one shilling and sixpence, a pamphlet which will readily instruct each man for himself how he can become not only an expert vaccinator, but have always at command a supply of the needful lymph. Not the least important part of the exposition is that in which reference is made to the author's own experience in vaccination; how, by his own method, the maximum of success is attained, and how lymph preserved in that particular manner may be safely sent to very great distances, used thereafter in all climates, and preserved unimpaired for many years.

Dr. Collinson's pamphlet contains an interesting *résumé* of the history of inoculation and vaccination, while it is further occupied by the consideration of many important points connected with the prevention of small-pox. We are at a loss to determine whether or not the observations relating to the preservation of vaccine lymph in capillary tubes, and the bearing that has on the prevention of small-pox, are familiar to Dr. Collinson. We are inclined to think that, though he has certainly not awarded it the distinction it deserves, he has not entirely overlooked this method, for we find him remarking that the grand result contemplated more or less in the use of all means and contrivances—namely, the extirpation of the direful malady, small-pox—may to a certain extent be secured by a careful "husband-ing" of perfect lymph.

ART. III.—*Histoire Littéraire des Fous.* Par OCTAVE DELEPIERRE. —*London*, 1860. pp. 184.

The Literary History of Lunatics. By OCTAVE DELEPIERRE.

"IF there be a curious book on bibliography yet to be published, it is one on the bibliography of the insane, and if it were desired to form a piquant, curious, and instructive collection of books, it would be from their works." This sentiment of M. Nodier, the author of the small, but highly interesting book whose title is given above, prefixes to his introduction as the theme of his discourse, and though not a medical man, but a *littérateur* of eminence particularly versed in the curiosities of history, he yet shows much acquaintance with the phenomena of insanity and the analysis of morbid mental action.

His acquaintance with antiquarian lore and his bibliographical knowledge, have enabled him to reproduce from the well nigh forgotten publications of past ages, some most extraordinary examples of insane literature, and to sketch the history of the unfortunate authors, a history, alas! for the most part, of persecution and imprisonment, and often of torture and the infliction of capital punishment. However, M. Delepierre does not restrict his examples of insane authors to the middle ages, but cites others in our own day, not forgetting the ephemeral productions originating in our British asylums which have either casually found their way to public notice, or, as in the asylums of Edinburgh and Dumfries, have been systematically published in the form of journals. The manner in which the author has collected his materials for illustration, would indeed indicate his pursuit of his subject with genuine gusto. He has not only possessed himself of the

Dumfries 'New Moon' and the 'Morningside Mirror,' but has picked up stray compositions which it appears have been at times sold at the bazaars formerly held at the Hanwell Asylum.

In the short space within which this bibliographical notice must be confined, it is not possible to attempt even the most limited selection from among the more amusing or the more terrible instances of mental aberration, as depicted in the literary productions of its unfortunate victims. But we would refer the reader to the book itself, which, besides being an essay on a hitherto unexamined subject, full of interest and instruction, further commends itself to a favourable notice by the manner in which it is got up, both in its typography and binding.

ART. IV.—*On the Employment of Trained Nurses among the Labouring Classes, considered chiefly in relation to Sanitary Reform and the Arts of Life.* By a PHYSICIAN.—*London*, 1860. pp. 32.

THIS is a well-meaning pamphlet, written for the purpose of advocating, as its title implies, the extensive employment of trained nurses among the labouring classes. The author argues that the absence of all sanitary knowledge among the labouring classes may be supplemented and removed by the intercourse with well-trained nurses, and he states very justly, that without the aid of the nurse the medical man's labours and the endeavours of visiting ladies and of the clergy, are to a great extent frustrated. "A Physician" is of opinion that the two training institutions existing, one at the West-end and one at the East-end of London, provide us with all we need in the shape of nurses. Granting, for the sake of argument, that those sisters are all that he wishes them to be, does he think that the two institutions alluded to are, or can become, able to meet the thousandth part of the requirements of the London labouring population? But, however excellently those institutions may train their nurses, we fear the latter will never reach the standard of measurement adopted by "A Physician," for—

> "The kind of person contemplated is to be not only an attendant upon the sick, but the friend and adviser of the poor in all that concerns their daily life and temporal welfare. She should therefore be well-informed in all matters that conduce to make the life of the working man a more successful affair than he makes of it at present. She ought, for instance, to be able to give information concerning the rules and regulations of provident and friendly societies, of all kinds of clubs, questions concerning the pawnbrokers' shops, lending libraries, and cheap periodicals of a wholesome tendency. It would also be very desirable if she had some knowledge of law, as far as it concerns the poor, such as the law of settlement and removal, marriage and judicial separation, the recovery of debts, and other similar questions."

We believe in the gradual progress of the country and in the march of intellect, but however sanguine we may be, we cannot yet see signs of the advent of a time when so much may be expected of a nurse. In the meantime, let us be satisfied if we can but obtain nurses who understand what is really their business; let us seek by all means in our power to multiply them for rich and for poor, and let us labour especially to obtain what a committee of the Epidemiological Society has so long and urgently striven for, a sanitary corps of well-trained nurses to act in conjunction with those medical men whose practice lies chiefly among the labouring classes.

ART. V.—*Clinical Lectures on the Diseases of Women and Children.* By GUNNING S. BEDFORD, A.M., M.D., Professor of Obstetrics, the Diseases of Women and Children, and Clinical Midwifery in the University of New York. Sixth Edition, carefully revised and enlarged.—*New York*, 1860. pp. 653.

THAT in five years six editions of a work of this nature should have been demanded, is no small recommendation. We reviewed it favourably on its first appearance,* and can now only repeat generally the commendations then bestowed upon its contents. Since the publication of the first edition, three new lectures have been added, which are of as desultory a character as the remainder of the work, and will therefore not allow of a systematic analysis here. The reports of the conversations between Dr. Bedford and his patients are retained, and help, perhaps, to render the book amusing, though they certainly do not add to its scientific value. In an appendix, the results of the treatment in some of the cases detailed in the body of the work, are given, which to a certain extent supply a defect which we pointed out in discussing the merits of the first edition; still, as these are selected cases, they are only approximatively indicative of the author's success.

ART. VI.—*On Diabetes, and its Successful Treatment.* By JOHN M. CAMPLIN, M.D., F.L.S. Second Edition, revised and enlarged.—*London*, 1860. pp. 88.

MOST of our readers are probably acquainted with the paper of Dr. Camplin in the 'Medico-Chirurgical Transactions' (vol. xxxviii., 1855), in which he gives an account of the successful treatment of diabetes in his own case, and the particular benefit which he derived from the use of carefully prepared bran-bread. The diet and regimen which he pursued is given in detail, and has doubtless often been referred to with advantage by medical men under whose care cases of this description fell. The volume now before us contains a reprint of this paper, with an account of the experience acquired by our author since its publication. He was originally attacked in 1844, and was then so ill that his medical friends despaired of his recovery; but when the paper was published in the 'Transactions,' he was able to report himself free from the diabetes. Two relapses subsequently took place, the first in consequence of fatigue, the second from exposure to east wind and damp, both, however, yielded to strict diet and tonics. Dr. Camplin has found the plan of treatment which was pursued in his own case, to be equally successful in those diabetic patients who have come under his personal care since the publication of his paper. In one case, not immediately attended by Dr. Camplin, a young lady could not be prevailed upon to try the bran-cake, nor to submit to any appropriate regimen, and the result was unsatisfactory; another is mentioned which terminated fatally, "in which attempts were made to manufacture the bran-cake, but the result was unsatisfactory, either from not having a sufficiently fine mill, or some fault in the manipulation."

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* British and Foreign Medico-Chirurgical Review, January, 1856.

Dr. Camplin enters fully into the theories advocated by Dr. Pavy and Bernard regarding glycogenesis, and makes numerous practical suggestions not contained in the original paper or the former edition of this little work, which we heartily commend both for its very useful and instructive contents and its pleasant and agreeable style.

Art. VII.—*Beiträge zu einer Monographie der Gicht.* Von Dr. Med. Braun. 1 Heft.—*Wiesbaden*, 1860. pp. 130.

Contributions to a Monograph on Gout. By Dr. Braun. No. 1.

The mineral waters of Wiesbaden, with those of Carlsbad and Vichy, have long held a very high rank among the remedies of gout; hence the physicians residing at these places have large opportunities of witnessing certain forms of this disease. The writer of the present monograph is already favourably known to us as the author of other works of scientific value, one of which, entitled 'Wiesbaden als Heilquelle,' we introduced to our readers some time back.* Dr. Garrod, too, in his recent work on gout, has drawn attention to Dr. Braun's researches, which were made with a view to determining "the effects of these waters on the urine, which appear to show that a very large increase in the elimination of uric acid and urea arises from their exhibition, either in the form of bath, or when taken internally."

In the number of Dr. Braun's new work now before us, he combats the humoral pathology of gout, and particularly objects to the theory that the essence of gout consists in the presence of uric acid in the blood. He admits the fact, but he maintains the excess of uric acid in the blood to be the product of a diathesis. The accumulation being induced by defective renal secretion, the subsequent derangements of the digestive and nutritive processes cause a further increase, and at the same time a diminished metamorphosis of the urea is caused by frequent congestions and diminished activity in the respiratory function.

The author argues that an attack of gout consists in a primary irritation of the peripheric expansion of the sensory nerves, and must be regarded in the light of a neurosis. The following are his reasons for this view:

"1. The condition of the nervous system before an attack, with symptoms of excitement or depression; the exciting causes which all have reference to the nervous system; the sensation of stroking, of blowing, of formication in the nerves of a part about to be attacked—symptoms regarded by Valleix as those of neuralgia.

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* British and Foreign Medico-Chirurgical Review, p. 459. October, 1855.

"2. The intermissions during the attack, which sometimes are so complete, that it may be regarded as consisting of a series of slight attacks, which return at a certain hour.

"3. The rhythm of the attack, which may be an annual or semestrial one, and often is maintained in spite of all prophylactic endeavours.

"4. The tendency to metastasis, which on the operation of external injurious influences takes place suddenly, and accompanied by an immediate disappearance of all pain in the part primarily affected.

"5. The character of the metastasis, which produces nervous symptoms in the part secondarily affected, without organic changes.

"6. The effect of treatment, which teaches us that all narcotics, and especially opium and colchicum, soothe the pain, and can even cut it short, while all other remedies are futile.

"7. The peculiar nervous debility which remains in the affected part some time after the attack."

We may, on the appearance of the remainder of Dr. Braun's work, take an opportunity of discussing his arguments more fully; at present, we must content ourselves with a brief summary of his views regarding the use of the Wiesbaden waters, which our readers will remember are thermal, their efficacy being mainly due to the large quantity of chloride of sodium which they contain.

We have seen above that it is upon opium and colchicum that Dr. Braun places his reliance in the paroxysm; but it is the diathesis that we have especially to direct our treatment against, and although we have no specific that is capable of subduing it, he considers both alkalies and colchicum more likely to injure than benefit the patient when taken habitually; he speaks very positively of the lasting benefit afforded by the Wiesbaden waters. Still, he says that they are not sufficient in themselves to effect a cure, but "form a link in the chain of curative efforts made to alter the constitution and to eradicate the tendency, undertaken by a patient's ordinary medical adviser."

Dr. Braun, from numerous experiments and observations, has concluded the following to be the effects produced by the waters in question upon the human organism:

"1. They allay acidity and dissolve the mucus of the stomach, exciting the organ to increased activity. 2. They purge the lower part of the intestine. 3. They alter the blood chemically, by increasing the watery, saline, and earthy constituents, maintaining the protein compounds in solution, promoting the formation of the blood globules by the iron, and maintaining their form. 4. They stimulate the circulation, especially the portal system. 5. They excite the peripheric nervous system of the spinal cord and the ganglia. 6. They limit and improve nutrition. 7. They accelerate the metamorphosis and favour the solution of the albuminous and fibrinous compounds. 8. They promote the activity of the lymphatic system. 9. They promote the secretion of the kidneys, the liver, the salivary glands, the intestine, the uterus, and the cutaneous surface."

The prevailing humoralism of the day may be startled by Dr. Braun's theory, but it is stated in a manner commanding our attention. We shall be glad to meet him again in the same field of literature, as whether we agree with his theory or not, it is interesting, and we can find no fault with his style of practice and the inferences he arrives at in regard to treatment.

ART. VIII.—*The London Medical Review.* Monthly. No. 1. July, 1860.

THE success which attends medical periodical literature would not, we should have thought, offer very great inducements to editors or publishers to commence new undertakings of the kind. The recent failure of two such publications scarcely augurs very favourably; still, the 'London Medical Review' perhaps opens under peculiar auspices, promising a more fortunate issue. In the address which prefaces the new journal, we are told that the proposition to establish a new monthly periodical has been warmly received by "men of high scientific attainments, holding important positions, who are looking with hope and confidence for our advent, and prognosticating favourably of our success."

The 'London Medical Review,' as its title-page informs us, will appear monthly; we gather from the address that its promoters "have made extensive arrangements in order to collect and record the progress of discovery and the results of experiments abroad as well as at home." We are also told that the services of gentlemen have been secured in this country and on the Continent, "who, from their acquaintance not only with the languages, but the practice and progress of medical science, will be able from time to time to record for the benefit of our readers all that transpires which may be of interest to the profession in those countries which take an elevated position in the civilized world."

The Review is to contain original articles, reviews, medical and surgical cases, and reports on the progress of medical literature at home and abroad. The present number contains original articles by Dr. Wilks, Mr. Holmes Coote, Mr. Hulke, and Dr. Coote. Several recent works, such as the 'Transactions of the Obstetrical Society of London,' Dr. Hood's pamphlet 'On Criminal Lunatics,' Mrs. Baines' Hygienic Tracts, are examined in the review department; Mr. Worthington follows with a case of rupture of the stomach and spleen, observed in the Middlesex Hospital; Mr. Marley gives a case of cancrum oris; and Dr. Squire contributes a report on the progress of chemical science in connexion with medicine. A few extracts from foreign journals, and scraps of medical gossip, conclude the number.

The original articles are all of considerable interest, though of three only the commencement is given, the continuation being announced for the next or future numbers. Dr. Wilks discusses the best mode of arranging tumours and new growths, dwelling upon the absence of any microscopic element which in itself justifies the distinction of benignant and malignant growths, their essential difference consisting in the fact that in the former we merely have a local, in the latter a constitutional influence; the combination of these influences and the predominance of one or the other, in the opinion of the author, accounts for the varying character of the pathological growths found in different tissues and organs. In the second original article, Mr. Holmes Coote directs our attention to the conditions giving rise to curvature of the spine, and to the treatment to be pursued. The author states, contrary to the prevailing opinion, that he has found lateral curvature to be not uncommon in growing boys. An interesting account of the ophthalmoscope and its revelations, by Mr. Hulke, follows; and the original communications are concluded by Dr. Coote's 'Observations on a Case of Perforating Tumours of the Dura Mater.' It occurred in a lad aged fifteen, in whom both tables of the skull were perforated in five different places by the protrusion from within of tumours growing from the dura mater. The tumours were very vascular, and besides capillaries, consisted of "areolar tissue, with elongated spindle-shaped cells and a small proportion of round cells, containing each one minute nucleus." The disease lasted altogether nearly eight months, having commenced suddenly while the patient was at work in the fields. On admission, seven weeks from its commencement, into Middlesex Hospital, a tumour had already formed on the left frontal eminence, about the size of a small bean, which subsequently increased considerably. The other perforations were not discovered till after death. Headache, various paralytic and convulsive affections, characterized the disease.

ART. IX.—*The Causes and Treatment of Imperfect Digestion.* By ARTHUR LEARED, M.B., M.R.S.A., Member of the Royal College of Physicians, London; Physician to the Great Northern Hospital and to the Royal Infirmary for Diseases of the Chest; Lecturer on the Practice of Medicine and Materia Medica at the School of Medicine adjoining St. George's Hospital, &c.—*London*, 1860. pp. 224.

AFTER giving, in his first chapter, an account of the prevailing doctrines of the physiology of digestion, Dr. Leared proceeds to inquire into the various causes which induce dyspepsia; the various circumstances of diet and regimen, the incidents of civilized, and especially of town life, are dwelt upon; and the only addition that we should have wished made here, are the excessive libations of tea by which so many individuals of both sexes derange their nervous system and weaken their digestion. In the third chapter, the symptoms of dyspepsia are collectively examined, and the various features of the affection are placed before the reader in a way which will enable him readily to recognise or remember them. The author, in the fourth, fifth, and sixth chapters, discusses the two forms to which he reduces all the varieties of dyspepsia—viz., accidental and habitual dyspepsia. It is a question whether the pathological conditions accompanying these forms are not often merged into one another; and whether, as on the one hand, the repetition of attacks of accidental dyspepsia leads to habitual dyspepsia; so, in an habitual dyspeptic, an individual attack is not generally due to some such cause as that which induces accidental dyspepsia. Habitual dyspepsia is considered as simple dyspepsia, dyspepsia with acidity, dyspepsia with gastric fever, dyspepsia with fetid eructations, and dyspepsia in which mixed symptoms predominate. In speaking of undue acidity, Dr. Leared makes the very just observation, that it is a feature of two opposite habits; the one characterized by debility, anæmia, and general want of tone; the other, where plethora is more or less marked, and the vital functions are vigorous. We have ourselves long made this observation, and adapted our treatment accordingly—opposite remedies being required in each case. Again, we were struck with the justice of the author's remarks with reference to the gastric derangement and suffering occurring from neglect of taking the necessary supply of food, even among the higher classes, whose mental fatigue, affliction, and other causes frequently prevent our patients from attending to the normal dictates of their digestive organs.

In speaking of the treatment of dyspepsia, great stress is very properly laid upon the necessity of attending to hygienic agents; Dr. Leared particularly adverts to the importance of substantial breakfasts—a point not sufficiently insisted upon in these times of intense labour and competition. Nothing can be more prejudicial to health in general, and to the digestive powers in particular, than the prevailing system of doing the chief work of the day, as so many of us do, without having taken any proper nourishment, and leaving the nutrition of the body to the time when its vigour and strength is no longer required.

Dr. Leared's little volume is suggestive, and contains a great deal of useful matter in a succinct and readable form.

Art. X.—*Fourth Report of the Commissioners of Her Majesty's Customs on the Customs.* Presented to both Houses of Parliament by command of Her Majesty.—*London*, 1860.

The comparative trade of the year, the discrepancy between the values of imports and exports, and other commercial matters discussed in this Report, concern the Medical Profession, as they do the rest of the community. It is not, however, to these subjects that we are able to devote any space; the excuse we have of drawing the attention of our readers to this blue book is in the report by Dr. M'William, the Medical Inspector of the Water Guard and Waterside Officers of Her Majesty's Customs.

The summer of 1858 was one in which the excessive heat and dryness of the season gave rise to serious apprehensions in regard to the probability of an outbreak of epidemic disease. The Thames was peculiarly offensive and noisome both in 1858 and 1859, and yet among those most exposed to its exhalations there was no increase of disease, and particularly no production of those forms which are usually ascribed to malarious origin. In the report of Dr. M'William, for 1858, the author urged the importance of remedying the miasms and foul emanations arising from the Thames; but a careful examination of the evidence before him compelled him to state that—

> "It is nowhere sustained by evidence, that the stench from the river or docks, however noisome, was in any way productive of disease. On the contrary, there was less disease of that form to which foul emanations are supposed to give rise than usual." (Third Report, p. 77.)

In that year, at least, the river did not generate cholera; and, strange to say, when in 1859 cases of undoubted cholera were imported by at least three vessels in the course of the summer, the disease in no case spread.

> "*This filthy river, therefore,*" to use Dr. M'William's own words, "*in these two summers seemed neither capable of generating cholera, nor of forming a soil fit for the germination of the seeds of that disorder when introduced into it.*"

We italicise these words because they certainly deserve to be impressed upon our minds. We trust that they may in no way interfere with the progress of sanitary reform, and more especially with the project of the Thames embankment and other schemes intended for the purification of that great highway; but it would not be right to ignore a fact which appears to show strikingly the fallacy of some of the arguments upon which the doctrines of sanitary reformers are based.

Dr. M'William reports very favourably on the result obtained by the deodorizing measures carried out by Professor Miller of King's College. Notwithstanding the great and prolonged increase of temperature in the summer, the preceding defective rainfall and consequent diminution of fresh water, Dr. M'William found the river, although on one or two occasions for a short while more offensive, much less continuously noisome during the year 1859 than in 1858.

ART. XI.—*On the Nature, Prevention, Treatment, and Cure of Spinal Curvature and Deformities of the Chest and Limbs, without Artificial Supports or any Mechanical Appliances.* By MRS. GODFREY. Third Edition, carefully revised and enlarged.—*London*, 1860. pp. 131.

ALTHOUGH the present edition of Mrs. Godfrey's work is very considerably increased in size, it vouchsafes even less information on the method of treatment pursued by the authoress than the first, which we noticed on a former occasion.* Much was then made of "animal oil," which is no longer mentioned. Some kind of manipulation is evidently practised, and, as far as we can gather from the "cases," it appears to be eminently successful. As we have not, however, the means of investigating the procedure, and of laying an account of it before our readers, we are equally compelled to decline expressing any

* British and Foreign Medico-Chirurgical Review, p. 209. July, 1852.

opinion upon it. As Mrs. Godfrey has had the most gratifying success with many patients who were left in a hopeless condition by their medical advisers, she can well dispense with the reward due to successful scientific authorship.

Art. XII.—*Klinische Mittheilungen von der Medicinischen Abtheilung des Allgemeinen Krankenhauses in Hamburg aus dem Jahre* 1858. Von Dr. C. Tüngel.—*Hamburg,* 1860. pp. 139.

Clinical Reports of the Medical Department of the General Hospital in Hamburg for the year 1858. By Dr. Tüngel.

The absence of a university or school of medicine in Hamburg is the apology offered by the medical officers of its large hospital for the very limited contributions they have hitherto presented to medical science. This is the more to be regretted for Germany, as the peculiar position of the town, and its commercial relations, distinguish it in every way from those localities from which, in that country, instruction is imparted to the medical mind. There can be no doubt that, in medical as well as in social relations, peculiar circumstances induce peculiar results. The rebuilding of Hamburg since the destructive fire, the introduction in the new part of the town of the most approved sanitary appliances, the tidal canals that traverse the old Hanse town, the constant influx of foreigners from all parts of the world, are some of the numerous points which might serve as texts for eloquent and instructive discourses of a medical character. We may have no right to look for any such general topics in a clinical report; but as the author has departed from the ordinary routine, and has given a selection of cases and a narrative summary of his observations, rather than a mere hospital report, we would only express a wish that he should have taken a yet greater licence, and favoured us with some insight into the general topics above suggested.

In the communications before us, we are informed that the total number of medical cases that came under Dr. Tüngel's care, and that of his assistants, during one year, was 3118, with a mortality of 14 per cent. The number of cures was 1526, 250 were dismissed improved or incurable, 519 were transferred to other departments, 462 died, and 361 remained under treatment. The volume is not of a character to bear a consecutive analysis; it is chiefly of local interest. We may, however, pick out one or two observations suitable for our readers. In speaking of the treatment of acute rheumatism, the author states that lemon juice produced no particular modification in the course of the disease; the usual treatment consisted in the administration of nitre, morphia, and Dover's powder; and when the heart, lungs, or pleura were affected, leeches, blisters, digitalis, and calomel were called to aid. The alkaline carbonates do not appear to enjoy any reputation in Hamburg in the treatment of rheumatism. In the chapter which discusses the diseases of the organs of respiration, we find that the author has discarded venesection entirely in the treatment of pneumonia; when there was much dyspnœa and pain, hot fomentations, and at times cupping, were employed; when the symptoms were severe, digitalis was given, with or without nitre, and occasionally with calomel. Nitre and tartrate of antimony were often given alone, and followed up by muriate of ammonia, ipecacuanha, oxysulphuret of antimony, and sometimes senega. Small doses of Dover's powder, at short intervals, were found very beneficial; blisters were employed when the disease was of a sluggish character. The author altogether repudiates the idea of there being a specific for pneumonia, and sums up his views thus:

> "The results obtained in the Hamburg Hospital have confirmed the experience of many other observers, that in the lobar pneumonia of patients under sixty years of age, perhaps with the exception of the first years of life, a suitable regimen is the matter of most importance, and that medicines and other therapeutic proceedings may serve to promote the cure, but are not absolutely necessary."

Dr. Tüngel holds that all the various remedies advocated in the treatment of pneumonia may, according to circumstances, be useful, but that none merit being exclusively employed.

Under the head of diseases of the digestive canal we find "acute catarrh of the stomach and intestines" occupying a prominent place—no less than 215 patients being entered under this category. The majority of these cases are described as having resembled typhoid fever, from which they differed mainly in their shorter duration, in the more rapid convalescence, as well as in the absence of the rose spots and the splenic enlargement. The author's observations on peritonitis are introduced with the remark that primary or idiopathic inflammation of the peritoneum was not met with in a single autopsy; he therefore argues, that in the cases that did not end fatally, and in which the cause could not be exactly determined, it is most reasonable to assume the existence of a definite local cause.

In concluding these brief remarks, we would thank Dr. Tüngel for having made this, we believe first, attempt to open up the great storehouse of pathology and therapeutics over which he presides. Let him but offer facilities for students of medicine, and we doubt not that the proximity of Hamburg would induce many of our junior physicians and surgeons to spend some time in that large hospital, which, as Dr. Tüngel himself admits, has not yet yielded that amount of fruit which it is capable of affording if properly cultivated. Whether vested interests or lay interference form obstacles to a development of the capabilities of the hospital we know not; but we should be disposed to augur that Dr. Tüngel is not unfit to prove the pioneer to a better state of things.

ART. XIII.—*Operative Surgery, adapted to the Living and Dead Subject.* By C. F. MAUNDER, &c. &c. Part I.—*London,* 1860. pp. 144.

WHEN the new regulations of the army and other examining boards seemed to recognise operations on the dead body as a substantive part of surgical education, Mr. T. Smith produced his manual of operations, which we reviewed favourably in a former number. Mr. Maunder's book was advanced in preparation when Mr. Smith's appeared, and therefore he determined to try his fortune against his rival. His work is rather more ambitious, since he treats of operative surgery in the living as well as the dead subject; but here we cannot say that he is very successful. The narrow limits of his work forbid the satisfactory handling of so large a subject, and it would have been better to have kept merely to the dissecting-room, or to have enlarged the work to four times its bulk and price. The book is illustrated by no less than sixty-six woodcuts, which, as the publishing price is three shillings, gives less than a halfpenny a cut, reckoning the letterpress for nothing, so that cheapness can hardly be carried further. Of course, at this price, the illustrations cannot be original, nor can they be in the highest style of art. Most of them, to say the truth, are far from agreeable, and some of them do not give a very accurate impression of the anatomy of the parts. Thus, in the woodcut (p. 47) representing ligature of the innominate artery, the thread appears to us to be placed under the common carotid, or at least much closer to the bifurcation than it should be. In his descriptions of operations, Mr. Maunder is rather more full than Mr. Smith, and he admits some operations which that gentleman passes over. But some of the latter are so cursorily mentioned that they might as well have been omitted (see "Transfusion" and "Operations on the Surface of the Body"). In others, the description is too compressed to be quite clear. Thus, we confess to having been a little puzzled with Mr. Maunder's description of the subcutaneous ligature (p. 19). But in general the description is sufficiently clear and accurate, and if in rather a rough and familiar style, this is perhaps not out of place in a student's book. Some curious omissions may be noticed. Thus, while the author describes excision of the wrist and ankle—operations which seem likely to drop out of surgical practice altogether—he gives no place to excision of the os calcis, which is so frequently indicated, and so eminently successful, in caries of that bone, and for the proper performance of which quite as much anatomical knowledge is required as for either of the others. The present part comprises minor surgery, operations on the vessels, and excisions. We hope its reception may be sufficiently encouraging to induce Mr. Maunder to complete his work.

Art. XIV.—*Illustrations of the Use of the Ophthalmoscope.* By William Martin, F.R.C.S., late Professor of Ophthalmic Surgery, Calcutta Medical College,—*London*, 1859. pp. 33.

This little pamphlet is written in a lucid and easy style, and is well adapted to bring before the reader the numerous affections which are described as being visible with the aid of the ophthalmoscope, and to refer him to works in which he will find them noticed more at length. We can therefore commend it to the notice of the reader for this purpose. We were disappointed, however, in looking through it, to find nothing, as it appeared to us, of original observation, but everything described on the authority of Desmarres, Graefe, Hogg, Bader, and other well-known writers. If Mr. Martin has undertaken any researches of his own with the ophthalmoscope, he does himself injustice in putting forward only those of others. In estimating the results of the application of an instrument like the ophthalmoscope, in which so much depends on the competence of the observer, it is peculiarly necessary that we should have some testimony of our author's individual expertness and good faith. Many of the "exquisite ophthalmoscopical diagnoses" are with great probability suspected of exaggeration. Mr. Martin enumerates more than forty different conditions as existing in or about the retina; besides other morbid states of the vitreous body, choroid, &c. Does he seriously mean that his own experience has convinced him of the visible distinction of all these conditions? If not, his treatise must be taken as little more than a guide to ophthalmoscopical literature, in which sense we can recommend it to students who desire to get an idea of what they are to look for with the ophthalmoscope. If, however, Mr. Martin means to assert the real and separate existence of this vast number of phenomena, we should have been glad to have seen some more evidence in his pamphlet that he had been able himself to recognise them.

ART. XV.—*Cellular Pathology, as based upon Physiological and Pathological Histology.* By RUDOLF VIRCHOW, Professor of Pathological Anatomy, General Pathology and Therapeutics, in the University of Berlin, &c. &c. Translated from the second edition of the Original by FRANK CHANCE, B.A., M.B., Cantab.—*London*, 1860. pp. 511.

PROFESSOR VIRCHOW'S celebrated work has at length appeared in an English form. After exciting the greatest interest, and no little discussion in Germany, it is now about to obtain a fresh audience, and to excite among us the same vehement appreciation, and the same keen and hostile criticism, which it has met with among Virchow's fellow-countrymen. We have made our readers already acquainted with the general doctrines of this book, but within the limits of a review it was quite impossible to do justice to the bold originality of the doctrines and to the extraordinary amount of research which this work presents.

One of its characteristics is the intimate way in which it connects physiology and pathology; as a mere account of the newest histological views it is interesting, but as an elucidation of morbid structure by reference to normal structure, it is really unequalled. Whatever decision may hereafter be come to on the vexed question of the connective-tissue corpuscles, and of the cellular pathology arising out of that much controverted doctrine, will not affect the value of this book. In every page are observations and statements which, independent of the contest, are of the highest value, and which no one who wishes to keep pace with the progress of our science should fail to know.

That this work will excite differences of opinion, and will give rise to sharp discussion, is no disadvantage. Such discussion is the very vital force of science, and we daily see what immense progress is thus produced, so that we look upon this work as important, not only from what it brings itself, but from what it will inevitably produce.

The work is a translation from the second German edition, and has been prepared with extraordinary care. We have compared it with the original, and have been struck with the extreme accuracy of the translation. It has been revised by Virchow himself, who has added a number of explanatory notes which are very valuable, and it is illustrated by excellent woodcuts.

It is quite clear that Dr. Chance has performed his duty most conscientiously, and we believe that he has succeeded in producing one of the most literal, yet at the same time readable, translations in the language.

ART. XVI.—*On Spermatorrhœa and its Complications.* Enlarged and Reprinted from the Original Papers published in the 'Lancet' for 1854, and the 'Medical Circular' for 1858. Fifth Edition. —*London*, 1860. pp. 59.

As this is the fifth edition of Mr. Milton's work, we should almost have supposed that he would have become indifferent to criticism, and satisfied with the success indicated by so extended a circulation; but that such is not the fact will be at once evident to any one who reads the preface to this treatise, in which he discharges on the heads of some critics in the 'Dublin Quarterly Journal' and the 'Medical Times' an amount of indignation and an array of quotations from the poets which might have been more suitably employed. A controversy between the periodicals above named and Mr. Milton, on the subject of spermatorrhœa, seems hardly a matter to which a quotation from Dante is very germane, and the one which Mr. Milton has introduced is so ludicrously inapplicable and so sadly damaged in the citation, that it had been better left out, even at the risk of leaving the world in ignorance of this part of his scholarship. We confess to a good deal of amusement from Mr. Milton's pages, and from the ingenuous vivacity with which he expresses his opinions. Whenever Mr. Milton gets upon general topics, illustrating a passage which may have occurred to him in his reading, he reminds us of the lines:

> "Praising and blaming were his usual themes,
> And both, to show his judgment, in extremes.
> So over-violent or over-civil,
> That every man with him was God or devil!"

But when he addresses himself in earnest to the topic of his book, and treats this unpleasant disease in its medical aspect, he talks such good common sense and such sound surgery, that we cannot but regret that flippant descriptions, such as that of the Jew quack at p. 4, and irrelevant stuff such as that from which we have quoted, should have been allowed to form so much of the bulk of the book. Let us hope that when a sixth edition is called for, Mr. Milton will allow his critics to sail unanswered, will let the backslidings of Magendie and Home sleep in peace in the grave, to which he may also consign the merits of John Hunter with advantage, since merit is only made ridiculous by exaggeration, and give us a regular business-like treatise on the diagnosis, pathology, and treatment of the affection he has selected for his subject.

For the rest, Mr. Milton's ideas on spermatorrhœa have been pretty widely circulated. He avoids the great error of most specialists—that of exaggerating the importance of his subject—nor does it appear to us that the book, with all its defects of style considered as a medical treatise, is intended to be put into non-professional hands; indeed, Mr. Milton candidly tells such persons labouring under the disease as may happen to open his book, that the less they read on such subjects the better.

He differs from other previous writers more in the greater stress which he lays on the internal, as distinguished from the local treatment, than in any other point; but for this we had better refer such of our readers as are interested in the matter to the original, where they will find it handled satisfactorily enough, and where, if their minds are not satisfied with Mr. Milton's dicta, they will find a table of authorities sufficient to inspire respect in Mr. Buckle himself, consisting as it does of two octavo pages closely printed, with the titles of, we suppose, all the papers ever written on the subject.

ART. XVII.—*Aspirations from the Inner, the Spiritual Life. Aiming to reconcile Religion, Literature, Science, Art, with Faith, and Hope, and Love, and Immortality.* By HENRY MCCORMAC, M.D.—*London,* 1860. 8vo, pp. 386.

THIS is a work which comes only to a small extent within the limits of our criticism, and we shall therefore give but a brief notice of it. It consists of a collection of what we must call aphorisms, for want of a better name, though they are too diffuse to come properly under that denomination. The variety of subjects on which the writer touches is very great—far too great, indeed, for any one mind, however gifted, to deal with profitably. He has adopted the design of merging all existing religious creeds, philosophical and ethical doctrines, poetry, art, science, history, and politics, into one system of philosophical theology, or theological philosophy, which shall elevate man to a higher intellectual and moral level than he has yet attained.

Those who are at all acquainted with the recent course, we cannot call it progress, of theological opinion in Germany, will not require to be informed that many ingenious thinkers have been for some years strenuously at work in the same field with Dr. McCormac, and have arrived at conclusions of which his are merely the echo.

Our province in this journal is not theology, and we should not therefore consider ourselves justified in entering the arena of controversy on such subjects; but we may be allowed, in passing, to express our opinion, that all the writers of this stamp are wofully deficient in one of the most essential qualifications for philosophical inquiry—namely, *candour*. In reference to religion, they have a right to adopt one of two courses—either to accept Christianity as it is presented in those writings professing to be divinely inspired, or to reject it on the ground that, to the best of their belief, those writings are not divinely inspired; but they have no right to twist and distort Scripture beyond all reasonable latitude of interpretation—to dilute it whenever it is too strong to suit their own palate—and to amalgamate it with all sorts of subjects with which it does not profess to have anything in common—thus making it merely a part of the heterogeneous mass of materials out of which they build up their own creed; which creed is, in reality, deism, whatever they may choose to call it.

Were it not that the book before us is written by a member of our own profession, and embraces some subjects connected with medicine, we should not have indulged even in the foregoing brief observations.

The passages, however, in which Dr. McCormac appears in his medical character are few, and we regret to say that these do not place his judgment in any very favourable light. For example:

> "INSANITY, CRIME.—It is but recently that insanity has ceased to be looked upon as an immediate providential award—nay, a demoniacal possession—and tacitly relegated to the dominion of science. The asseveration that insanity was of material origin, or that brain has mind for its principal function, throws no light on the subject; in effect, is not true. It has again and again been asserted that the brain was mind, and that its functions were the mental faculties. The brains of maniacs and criminals, unless in cases complicated with incidental disease, are not less healthy than those of other men. Cerebral disease has no necessary connexion with insanity and crime, which are alone ascribable to vicious, perverted training, and neglected individual culture. It is all-important to cultivate the intellect and the affections, since this would be to realize the divine idea, to prevent both insanity and crime—the insanity of thought with that of word and act. For as Porphyry has said, the ruling mind, though manifold, is one, and needs development, not in a single direction only, but in all. Perverted habits, undeveloped powers and affections, uncorrected lawless trains of thought and feeling; these, and not the material changes, vainly imagined by materialistic physiologists and divines, are the single sources of insanity and crime. To a pure and highly-disciplined will, indeed, under the guidance of divine law, moral health and well-being, avoiding both insanity and crime, are practicable as they are certain. And thus by progress on progress, ascent upon ascent, developing at once the individual and the race, man's soul might rise till it came to dwell habitually in that Presence before which no conceit or craze is possible, and in face of which evil cannot live." (pp. 366–8.)

The opinion that moral depravity is the essential cause of insanity is as repugnant to Christian charity as it is opposed to medical facts. It has, we are happy to say, found few advocates in this country; but not so in Germany, where it has been maintained by many. It is easily confuted by a reference to the numerous instances in which insanity has occurred in individuals of the most amiable and exemplary character, many of whom also, on recovering from the disease, have once more evinced all the excellent dispositions that were natural to them.

The large number of philanthropic persons who are in the present day so actively engaged in improving the physical as well as the moral condition of the masses, will not feel themselves much flattered by the following extraordinary assertion:—"The very idea, in truth, of effectually providing for the bodily conservancy and material elevation of the people seems practically unknown." (p. 108.)

We regret that the scope of this Journal does not admit of our giving examples from the volume before us of our author's manner of treating many other subjects on which his talents show to much better advantage. Indeed, it must not be supposed, from the censures we have passed on this work, that we regard it as devoid of literary merit. Dr. McCormac is evidently a man of cultivated mind and elevated feeling, and his book contains many just and beautiful sentiments, sometimes very happily expressed. But there is something painfully overstrained in the whole performance; and the author seems to have read and pondered too much for the natural capacity of his mind, which is evidently in a state of morbid tension and inflation.

" Pulmo animæ prælargus anhelet."—Pers. Sat. i. 14.

Dr. McCormac has on former occasions given proofs of his ability as a practical writer on medicine; and we should be rejoiced to see him again taking up some tangible and profitable subject of inquiry which might tend to dissipate the pantosophic dream which at present shrouds his intellect in its nebulous folds.

PART THIRD.

Original Communications.

Art. I.

On the Non-Prevalence of Pulmonary Consumption in the Hebrides, and along the North-Western Coast of Scotland. By JOHN E. MORGAN, B.A. Oxon.

HAVING resided for the greater portion of upwards of seven years in one of the western islands of Scotland, and having enjoyed considerable opportunities of making myself acquainted with the condition of the people, and the particular forms of disease most prevalent among them, I have often been struck with the comparatively small extent to which pulmonary phthisis exists in that portion of the country. Conversations with those whose professional duties, whether as medical men or as ministers of religion, brought them into frequent contact with the lower orders, confirmed the impression that this is a fact inviting further inquiry. The belief that a few trustworthy particulars on such a subject might prove interesting to the medical profession, induced me to write letters to the principal medical practitioners, and a considerable number of clergymen residing in the Hebrides and along the north-west coast, begging them to favour me with the result of their experience. During the course of the present summer (1860) I was further enabled to visit several of the outer islands with which I was not before personally acquainted, and thus to collect information on the spot, so that at present I am more or less familiar with the great majority of the districts to which it may be necessary to refer. In the opportunities I have enjoyed of visiting different portions of the coast and islands—opportunities which, from the difficulty attending public conveyance, but few possess, my fitness for giving the result of my inquiries and observation alone consists; I trust it may be deemed a sufficient excuse. After establishing, as I hope to do, the very small amount of mortality that arises from phthisis, I propose briefly to consider the different causes to which this favourable result either has been, or may be, attributed. The district of country over which my inquiries have been made, extends from the island of Mull in the south, to the whole of the Hebrides, and extreme portions of the north-western coast.

Setting out, then, with the island of Mull, Dr. M'Coll writes from Tobermory—"Consumption is very rarely met with in this locality, all the cases I have attended I could trace to neglected colds, and not applying in time for medical aid." Of Uisken, likewise in Mull, Mr. John M'Lean says—"In a population of three thousand, I can only remember three deaths from pulmonary consumption for the last three years; among upwards of three hundred paupers now upon the roll, there is not a single case." Proceeding in a north-westerly direction to the islands of Tyree and Coll, population four thousand eight hundred and eighteen, I learn from Dr. Anderson that "pulmonary consumption is rare—very rare." At Barra I was informed by the minister of the Church of Scotland, that during a period of fourteen years, in a population of about eighteen hundred, "he did not remember more than four or five cases, and these, with one exception, in elderly persons." At South Uist, Dr. R. Maclean stated, that in that island and Benbecula, with a united population of about six thousand, the annual death-rate from phthisis was not more than two or three. In regard to Harris, population four thousand two hundred and fifty, Dr. G. Clark writes—"I was thirty-two years practising in Harris, and during the whole of that period I cannot recollect more than about half-a-dozen of my patients who died of, or had, tubercular phthisis. In two cases, one contracted the disease while residing at Greenock, the other after a considerable residence there." In the island of Lewis the disease appears singularly rare: Dr. Millar, who resides at Stornoway, the capital of the island, thus expresses himself—"The medical gentleman who practised in this island before me, used, when filling up schedules of insurance of life, when the question, 'Did your parents or any of your relatives die of phthisis?' invariably to answer, 'No such disease known in the island.'" Dr. Millar proceeds—"I have now practised thirty years in this island, which contains a population of twenty thousand, and have been often struck by the immunity of the *natives* from consumption, but cannot go the length of saying there is no such disease." Respecting the northern portion of the mainland, Dr. Maclean, of Armadale, uses these words—"In answer to your inquiries respecting phthisis pulmonalis, I am glad to say that I have, with eleven years' experience in Sutherland and Inverness, found this disease very far from being prevalent; during these years I have had extensive districts under my charge, and been consulted for most serious cases in the surrounding country, so that I may say, at least eight or ten thousand inhabitants were under my medical charge, and I have very seldom had more than one or two cases of phthisis on my list at a time." From Gairloch, in Ross, Dr. Robertson writes—"I have been for the last twelve years the only medical practitioner in this parish, containing a population of upwards of five thousand, and my attention has been frequently directed to the rarity of this disease (consumption); I do not recollect having met with more than four or five cases during that period." From Applecross, a populous district, likewise in Ross, I learn, on the authority of Dr. K. Macdonald, "that consumption of the lungs is a very rare disease." Dr. Duncan says, in reference to Loch Alsh—"I have been here for four years, and have been much surprised to find to what a small degree pulmonary consumption prevails among the poorer population." The Rev. J. Macrae, of Glenelg, who for upwards of thirty years has been intimately acquainted with a district of country containing from five thousand to seven thousand inhabitants, states, that in that time "he has probably not seen more than ten or twelve cases of true tubercular phthisis." In the island of Skye, which contains a population of about twenty thousand, the death-rate from this disease is, in general, very low. Dr. Matheson, who has practised at Portree, the capital of the island, for upwards of twenty years, informed me as the result of his experience, that in that time he had not seen altogether more than twenty cases, and these were almost entirely confined to one district in the north of Skye (Kilmuir), and a large proportion occurred in one or two families. In this parish, and the neighbouring one of Snisort (according to Dr. Campbell), the disease appears in particular families more prevalent than in the other parts of Skye. Dr. Trotter, though not himself long resident in the island, was able to inform me on reliable authority, that "consumption is very rare in Duirnish and Bracadale," two parishes containing at the last census about seven thousand persons. Dr. Macallister concurs in this opinion respecting the south-west portion of Skye. Dr. Nicol Martin, who has resided for sixteen years in the neighbourhood of Dunvegan, spoke to the same effect regarding that district, and remarked that during that period "he did not remember having seen more than one case, and in that the disease was contracted elsewhere." In the island of Raasay, with which I am myself intimately acquainted, the disease may almost be said not to exist. During the last seven years, to my personal knowledge no single case has occurred, and in the course of the eight previous years this island appears, from inquiries I have made, to have enjoyed the same immunity. The population, I admit, is small, having never during that time exceeded eleven hundred, and being at present, owing to emigration, reduced to about six hundred.

I have thus briefly touched upon almost all the populous districts in that portion of Scotland over which my inquiries have more particularly extended. In regard to many of the places to which I have referred, I am in a position to enter more fully than I have done, both into the number of cases, the class of people, and the conditions under which the disease appeared to have been excited. My object at present, however, is merely to direct attention to the fact, which does not appear to be so generally known as its importance deserves; at least, I have not found it alluded to in any of the works more especially devoted to the climatology of disease. Before it is possible duly to appreciate the significance that ought to be attached to what may, after all, appear to some but as a chance occurrence, it is necessary to bear in mind the extent to which tubercular phthisis is generally diffused throughout every portion of England and Wales.

The Registrar-General's Reports now offer peculiar facilities for the obtaining of such information. Those for the years 1856 and 1857 (the latest published at the time I am writing), in addition to the tables usually given, contain an abstract "On the Deaths from several causes in Divisions, Counties, and *Districts* of England." From this source reliable facts may be gathered for instituting comparisons between these districts and other portions of the United Kingdom. A glance at the phthisis column in the Reports will plainly indicate that there is no portion of either England or Wales in which a far higher death-rate from this disease than that met with along the above coast of Scotland will not be found to prevail. On a further analysis of their contents, nothing is more remarkable than the singularly even-handed manner in which phthisis appears in all places to lay claim to a certain share in the general death-spoil. This fixed tithe of death, whether the district be healthy or unhealthy, in the case of England and Wales, it is alike inexorable in demanding. The truth of this proposition is brought strikingly out, on comparing the proportionate *phthisical* death-rate with the *pulmonary* mortality, relatively to a given standard of population (the method adopted in Dr. H. Greenhow's well-known paper). He selects twelve remarkably healthy rural, and as many notoriously unhealthy town districts, and proceeds to show "how great is the gulf between the salubrity of the healthy country districts and the unhealthy city." The extremes on the side of health and sickness are Glendale and Liverpool, and in regard to them Dr. Greenhow remarks, that "supposing the pulmonary death-rate of Glendale to be 100, that of Liverpool would be represented by 463. When, however, with a view to discover the proportionate *phthisical* mortality, we divide the total number of deaths in Liverpool and Glendale respectively by the deaths from consumption, we find that in Glendale 1 : 7·4 is claimed as its quota, while in Liverpool only 1 : 8·6. Nor is this a solitary instance, for on instituting a similar comparison between the whole of the twelve healthy districts and the twelve unhealthy ones, and striking an average, it appeared that in the former 1 : 8·1 was attributed to phthisis, in the latter 1 : 8·6. Thus again showing a slight proportional preponderance of deaths on the side of the healthy rural districts. Again, on instituting a similar method of inquiry in the case of all the counties in England and Wales for the three years, 1855, 1856, and 1857, and taking the average of both sexes, it appeared that of the whole list the proportion of phthisical deaths was highest in South Wales, where 1 : 6·3 was due to it; next in order follow North Wales, 1 : 6·5; Westmoreland, 1 : 6·7; Sussex, 1 : 6·9; Hampshire and Cornwall, each 1 : 7·2. In Durham the proportion was lowest of all, being only 1 : 11·2. The average of the aggregate of all the counties was 1 : 8·2. In the case of the eight chief towns in Scotland (in the year 1858), the only one for which I could obtain data for making the calculation, it was 1 : 7·3, being highest of all at Greenock, where it amounted to 1 : 6·4. Thus the comparative freedom from this disease enjoyed along the north-west coast evidently does not extend so far as the latter town.

I have thought it necessary to make these remarks with the view of showing this very general diffusion of consumption in the counties and districts of England and Wales, as, unless this be borne in mind, it is impossible to attach due importance to the exemption enjoyed by other places; and further, the very fact of this exemption is apt to be attributed to causes which would be equally applicable in numerous other localities. I have myself taken some pains in drawing up tables, and collecting statistics, both British and foreign, respecting this particular subject, which I hope at some future time to make public. I have confined my inquiries exclusively to phthisis, as, though cases may be entered under that head which do not strictly belong to it, still, in including all pulmonary affections in one class, we mix up disorders which differ in this most essential particular—viz., in the period of life at which they are prone to occur. Thus, in the seven years from 1848 to 1854, 107,831 deaths from pneumonia out of 154,402, or more than two-thirds, occurred in children under five years of age; whereas in the case of phthisis, not more than 1 in 14 proved fatal at so early a period. It further appeared, that during these seven years no less than four persons out of every nine who died between the ages of fifteen and thirty-five died of consumption. So much more important is the phthisical than the pulmonary mortality, as respects the value of life.

Let us now proceed to inquire what the particular local causes may be along the north-west coast of Scotland which exercise an influence in preventing the development of tubercle in the lungs. Many of the members of the medical profession, and others, who have favoured me with the result of their experience, have likewise kindly referred to causes which appear to them sufficient to account for this exemption. I will state them in the order in which importance appears to be attached to them. First, it is ascribed to a moist and mild climate, warmed by the Gulf Stream. Secondly, to the exposure of the natives to the hardening influence of the weather. Thirdly, to their clothing and diet. Fourthly, to the amount of ozone in the atmosphere. Fifthly, to some peculiarity of race. Sixthly, to the construction of the Highland cabins, and the manner in which they are heated. First, then, the climate, what is it? It may be briefly described as equable, mild, moist, windy, and deficient in sunshine. In winter, the snow rarely lies for any length of time, and the ice seldom "bears." In summer, a fire is always comfortable, especially in the evening. Bathing, though endurable, is never enjoyable. The amount of rain along different parts of the coast varies greatly, and seems to depend very much upon the height and geological conformation of the mountains which intercept the vapours warmed by the Gulf Stream in their passage across the Atlantic. Thus, for instance, in Skye, where the Cuchullin Hills rise to a height of upwards of 3000 feet, their bare, cold, hypersthenic peaks attract and condense these vapours, and as a natural consequence, the amount of rain in their neighbourhood is very great. From meteorological tables, carefully kept in the Island of Raasay for the last eight years, which I have been permitted to examine, I find that the average annual fall during that period was 71·5 inches (in London it is a little more than 20). The extremes registered were 84·5 in the year 1854, and 53·1 in the year 1856. The amount of rain [illegible] upon the direction from which the wind happens to blow. Southerly and westerly—wet winds—are more prevalent than northerly and easterly, in the proportion of about three to two. Thus during the last six years the wind blew from the west and south on [illegible] from the north and east on 865. At Stornoway, in Lewis, [illegible] miles to the north-west of Raasay, the average [illegible] was found to be 30·2 inches, or less [illegible] as at the latter place. The mean annual [illegible] Stornoway is 46° 5′: winter, 40° 8′, [illegible] autumn, 51° 6, and the extremes of [illegible] more than 30°, from 35° to 65°. At [illegible] 1860, the thermometer [illegible] 28°. The mildness of the climate [illegible] which are found to flourish in the [illegible] Thus in Raasay, myrtles [illegible] places, without any sort of [illegible] shrub, which in England [illegible] five or six feet, and requires that [illegible] in the same island, at- [illegible] feet, and stood even the late [illegible] Fuchsias likewise attain [illegible] and with such luxuriant [illegible] the wind to other shrubs. [illegible] in such a climate as this to [illegible] to prevent the development [illegible] very similar meteorological [illegible] is prevalent? In [illegible] the climate is mild, soft, [illegible] Clark [illegible] —The temperature [illegible] winter, so that the annual [illegible] scrofula and consumption [illegible] In Van Diemen's Land, [illegible] fewer cases of hæmoptysis [illegible] of our colonies." Even in [illegible] among the natives appears con- [illegible] Review, on Dr. Mühry's [illegible] remarks, as the result of his [illegible] investigations into the [illegible] climatic conditions the en- [illegible] Neither the tempe- [illegible] nor the geological [illegible] of the fact." From the [illegible] of the army, the same con- [illegible] climate of which is so [illegible] that the ther- [illegible] the proportional [illegible] as it is in the case of [illegible] dry and warm climate, the [illegible] West Indies, where the heat is [illegible] great, and the temperature remarkably equable, it is very prevalent. The climate of some parts of North Wales has always appeared to me more like that of the north-west coast of Scotland than any with which I am acquainted, and yet in Wales the proportion of deaths from phthisis, even in the wettest and windiest districts, is higher than that generally met with in many of the counties of England. In Wales I have seen myrtles and fuchsias flourishing out of doors much in the same way as along this coast.

Let us now consider the influence that may be ascribed to the out-of-doors employments of the people, and see what they are. The majority of the natives are fishermen, as well as cultivators of a small piece of land, and are thus naturally much exposed to the weather. During the "herring season," which, however, only continues for a few months, the fishermen pass a great part of the night at their trade, and take their rest during the day. The cultivation of the small patches of land, as it is entirely dependent upon handwork, necessarily involves a far greater amount of labour than would be imagined from their size. Out of 4435 families in Skye in the year 1851, 1888 were tenants renting less than eight acres of land. These would be small farmers as well as fishermen: while 1764 possessed no land at all, and consisted entirely of fishermen and paupers. From the above example, a general idea may be formed of the manner in which the great mass of the people are employed. Let us now see how far those engaged in open-air occupations, in the rural counties of England, correspond with these Highlanders, in respect to the non-prevalence of phthisis among them. In the most purely agricultural counties in England,—Lincoln, Hereford, and Cambridge, where the number of either sex engaged in mining and manufactures is quite insignificant, the phthisical death-rate is respectively 1 : 9·4, 1 : 8·7, and 1 : 7·7. In many districts in Wales where the people are altogether engaged in out-door occupations, the mortality from consumption is even still heavier. Again, in an article in the 'British and Foreign Medical Review,' on Dr. Gellerstedt's statistics on the diseases of the army in Stockholm, it is stated on his authority that "Phthisis is very frequent in many provinces of Sweden where the inhabitants spend the whole day in the open air."

A third cause on which many would feel disposed to attach much weight is the clothing and diet. "In old times," the former consisted entirely of wool, even the shirt being homespun. During the last fifteen or twenty years, a considerable change has taken place in this respect. The external clothing and stockings, when stockings are worn at all, are still woollen, but the under garments consist to a great extent of cotton. I have been informed by shopkeepers and others, who would be in a position to form an opinion, that in many districts more than half the population wear merely cotton shirts, without any sort of flannel underclothing. From May till October, the women and children usually go barefoot; but the former, when about to visit a village, often carry a pair of shoes in their hand. The diet consists of meal, potatoes, milk, and fish; and among the shepherds, who now constitute a pretty numerous class, of "braxy mutton," or the meat of sheep found dead. Oatmeal at particular seasons of the year is almost *the food*. It is eaten in the form of oat cake and porridge. In addition to meal, potatoes constitute an almost universal article of consumption. That portion of the poor population who rent a few acres of land, the crofters, are usually able to keep one or two cows, on the milk of which they partially subsist. The cottars, or class below them, who possess no land at all, and are merely permitted "to squat" on sufferance, neither pay any rent nor own cows, unless, as sometimes happens, they procure "a subletting" from a crofter. In 1851, as I have shown above, this class constituted more than one-third of the population of Skye, and in many of the other islands the proportion would probably be as large. Fish likewise is in very general use, and though, as far as animal food is concerned, many of the people may be looked upon as ichthyophagi, still their diet cannot be considered oleaginous. A diet composed in a great measure of oleaginous substances is held by some to be almost specific in preventing the development of tubercle in the lungs. Under this category the fish diet of the Hebrides cannot be comprehended. It contains in general but a small amount of oil, the oleaginous portion of many of the fish not being eaten. The herring is the only kind in common use in which we find any great amount. Eels are but seldom partaken of, a popular prejudice in many cases prevailing against them. Salmon command too high a price. In addition to herring, cod, ling, and skate are constantly met with, but the oil contained in these varieties is confined to the livers, which are melted down to supply the cabin lamp. Thus the only oleaginous portion of the food is contained in the herring, and in some districts the amount of herring is so insignificant that little importance can be attached to it. Besides, along parts of the east coast of Scotland, a fish diet is quite as general as along the west, and nevertheless phthisis is far more prevalent in the former than in the latter portion of the country.

Another reason which has of late especially attracted attention, is the amount of ozone in the atmosphere. Admiral Fitzroy remarks, in some notes on meteorology lately published, "that Lieutenant Chimmo has observed that in the Hebrides, and along the north-west coast of Scotland, there is more ozone than he had found in other places, including the great ocean." During a late cruise among the Hebrides, I was so fortunate as to fall in with Lieutenant Chimmo, who favoured me with the result of his observations. The scale in general use for estimating the amount of ozone, ranges from one to ten degrees, the depth of the shade of the test-paper indicating the quantity in the atmosphere. Lieutenant Chimmo stated that along this coast he had obtained shades of colour so much deeper than any given in the published scale, that he found it necessary, in order to express this intensity, to make 18° instead of 10°, the maximum, which extreme he had already, on more than one occasion, found expressed on the paper. He further observed that ozone appeared to pass over the coast in a sort of waves, gradually ascending to a culminating point, and then as gradually becoming less. Observations taken on the same days, on the west and east coast of Skye, at places about twenty miles distant from each other, showed him that on the latter side of the island, further removed from the Atlantic, the daily amount was about one degree less than on the former. West and south winds naturally brought more than north or east, and whenever the air was charged with electricity or snow, a high degree was invariably observed. At present, so little is known respecting the effects of this agent on the human constitution, that I would merely direct attention to the general fact of its excessive amount along the coast. One objection to ascribing to it any influence in preventing the development of tubercle in the lungs, is the circumstance of its being chiefly found in or near the sea. Hence we might expect to find sea-washed districts and counties less phthisical than inland places, but on comparing the two sets of counties, I found the latter, or inland, the more highly favoured of the two. Dr. Mühry also, whose opinion is entitled to weight, speaks of the amount of phthisis in islands and coast districts in general, which would naturally be the richer in ozone.

Another reason which has been suggested as applicable to the north-west coast of Scotland, is a certain distinction of race. It is urged, and from admitted facts with justice, that different nations are particularly susceptible of certain forms of disease, and that if phthisis is rare in the Hebrides, the Highlanders in that quarter are, as regards this affection, a favoured race. What, however, is their origin? History and local tradition alike speak of them as a mixed race. The Celtic aborigines were conquered by the Northmen, the victor and vanquished in time amalgamating. Still the infusion of the Celtic element has remained in such purity, as to permit the Highlanders and Irish, especially the natives of Connaught, where the purest Irish is spoken, to make themselves mutually understood. The Northmen, however, left their stamp upon the country in the names of places, the great majority of which in the outer Hebrides are of Scandinavian origin. They appear to have settled in greater numbers in the more northerly portion of the Long Island, for in Lewis, especially about "the Butt," the fair hair, blue eyes, and well rounded forms of the more northern race contrast with the more prominent cheek bones, thin lips, darker hair, and keen expression observable in the more southern districts of South Uist and Barra. In those islands, likewise, local tradition tells of a considerable infusion of Irish blood at a much later period. Thus, even granting that in certain districts the Scandinavian blood remains tolerably unmixed, in others the genuine Celtic is too unmistakeable to allow to this cause any sufficiently general application. Besides, it is only while residing along this coast that the Highlanders are found so exempt from phthisis, for in many of the cases that have been referred to by my correspondents, the disease was contracted in other places, and the patient merely sent home to die. A remark on the same subject by Dr. Schleisner, who was commissioned by the Danish Government to visit Iceland in 1847, deserves attention; it is to the effect that though the Icelanders *in Iceland* are singularly exempt from phthisis, still when they come to Denmark, they are pretty frequently seized with its symptoms.

There is yet another cause which, though I am bound to say it finds but little favour, possibly from its unpleasant accompaniments, may have more to do with the non-development of tubercle in the lungs than any I have hitherto considered,—it is the peculiar construction of the dwellings of the lower orders, and the manner in which they are heated. I will endeavour, as faithfully as I am able, to describe an aboriginal Highland bothie. If the occupier happen to be a crofter, it is constructed with a view of accommodating both the family and cattle; if only a cottar, the former enjoy undisputed possession. The crofter's hut is in general about forty feet by fifteen. It is built entirely of rough, unhewn stones, no mortar of any kind being used. The external wall rises to a height of five or six feet, the corners being rounded off, so as to offer less resistance to the wind. There is usually but one door for man and beast; often no window of any kind, though occasionally a very modest one peeps out on the most sheltered side of the dwelling. The roof, supported on a few unhewn rafters, is thatched, heather, ferns, or rushes supplying material. In one corner is a hole about a foot in diameter, for the escape of the smoke. There is no sort of chimney. Such is the outside. On entering, you find yourself in the byre, or portion of the dwelling assigned to the cattle. Here the manure often accumulates to such an extent, that the elastic, springy sensation of a farmyard is experienced. A slight wooden partition, not extending so high as the roof, separates the byre from the inner dwelling-place. Here, in the centre of the apartment, a small paved space, some three feet in diameter, rises a few inches above the surrounding floor. On this a peat fire is kept constantly burning during the day. Above it descends from the roof a rope, with a chain attached to the lower end—the crook chain—from which a large pot or cauldron may be seen suspended; a kettle and girdle — a flat pan for making oat-cakes — complete the stock of culinary utensils. A small dresser for holding plates, bowls, &c., which, from their varied patterns and shapes, resemble a collection of large shells—a few three-legged stools, one or two large boxes for clothes, and some beds, boarded on three sides, make up the list of furniture. In addition to this sitting and reception room, there is frequently an inner sleeping apartment, partially separated from the former. Before the doors of the huts, the pools of stagnant water, and refuse of all kinds, through which the visitor must thread his way on stepping-stones, accumulate to such an extent as would gladden the heart of Cloacina herself.

Now, it may be asked, and I am ready to admit with justice, what can be found conducive to health in such a dwelling as this? Is there anything here which explains the low rate of mortality in the counties of Ross and Inverness? This question I will attempt to answer. In the first place, then, the inmates of these huts enjoy, if not an altogether perfect, at least a very efficient system of ventilation. The smoke is frequently seen escaping, not only at the smoke-hole and the door, but through innumerable crevices in the walls of the house, showing that they are pervious. From the fire likewise being in the middle of the apartment, the different currents of air seem, as it were, to meet and neutralize each other, so as to prevent any excessive draught, at least I have often found the draught far less than might be anticipated. The being exposed in this manner to the influence of the atmosphere, especially at night, tends doubtless, in no small degree, to the hardening of the constitution, and enables the people to escape those continual rounds of coughs and colds which are so frequent among the dwellers in more civilized abodes. While, however, we pay all due regard to the beneficial effects of ventilation, we are forced to admit, that though these effects are undoubtedly great, they are certainly insufficient to prevent a very prevalent disposition to a scrofulous taint. Many of my correspondents especially dwell on this circumstance; about seven years ago, I happened to be present at a pretty extensive inspection of some of these families by an emigration commissioner, previous to their being permitted to emigrate, and I was much surprised to find how large a proportion was rejected from exhibiting unmistakeable signs of a scrofulous diathesis. In none of these rejected families has a case of pulmonary consumption occurred since that period. The people, in many of the small islands especially, live so much separated from the rest of the world, and have for so many generations continued to intermarry within such circumscribed bounds, that the prevalence of scrofula seems sufficiently natural. In the island of Raasay, and one or two smaller sister isles, a population of about one thousand persons resided on the same spot for at least five hundred or six hundred years, and such was the general tendency to isolation, that even in so limited a number certain names are very much connected with particular hamlets. Nearly one-third of the population bore the name of M'Leod, which, with the addition of six other surnames, included almost every family. The same fact holds true of all the Hebrides. Thus, in the Lewis the name M'Leod is very general in the south of the island, while that of Morrison prevails to the north. In former times, the constant feuds of the different clans, and the spirit of rivalry and animosity thereby engendered, contributed very much to keep up this intermarrying tendency. Thus one cause that has been found productive of scrofula, has long been in full operation along the coast. If, then, this scrofulous cachexy which is in general so favourable a soil for the development of pulmonary tubercle is rife, and if tubercle, notwithstanding, is singularly backward in invading the lungs, may there not exist, as far as these organs are concerned, some specially protective influence? Throughout the whole of the district of country of which I have been speaking, if there is any one condition under which the people live more generally diffused than any other, it is the use of a peat fuel of a remarkably good quality. As in the great majority of houses there is no sort of chimney for carrying away the smoke, the products of the combustion of this fuel are largely inhaled by the inmates. A stranger unhabituated to these fumes, experiences on first entering a Highland bothie a certain sense of oppression and smarting at the eyes. On sitting down—the natives rarely stand much in their houses—this inconvenience is less felt, as the smoke accumulates towards the roof, though the air around the fire is still largely charged with the gases given off in the process of combustion and impregnated with their smell. Hence a dry and parched sensation is imparted to the skin. It would be but natural to suppose that the inhalation of such an atmosphere would rather prove injurious than in any way conducive to health. To dwellers in towns especially, the bare mention of smoke is calculated to convey any idea rather than that of the healthful or the agreeable. That the fumes of this peat are not at any rate detrimental to health, may be gathered from the fact that none of my correspondents—many of whom are strong in their expressions of hostility to the dirt—refer to any more serious consequences as arising from their use; with the exception, perhaps, of occasional cases of chronic inflammation of the eyes, especially in elderly persons. The average amount of peat burnt in the course of the twenty-four hours varies, with the season of the year, from thirty to fifty pounds. In cold weather the fire is "made up" before retiring to rest, and continues to smoulder during a great portion of the night. Dr. Macculloch, who was intimately acquainted with the Highlands of Scotland, refers to the absence of any kind of chimney, and says there can be little doubt of the "efficacy of this rude method of warming the houses in preventing the generation of disease." In another work, in referring to the prevalent diseases of the Hebrides, he speaks of the "chimney as a premature improvement," and remarks—"Old Harrison was of the same opinion some time ago, who uses these words, 'Now have we many chimneys, and yet our underlings complain of rheums, catarrhs, and poses. Then had we none but reredosses (open fires), and our head did never ake. For as the smoke in those days was supposed to be a sufficient hardening for the timbers of the house, so it was reported a far better medicine to keep the good man and his family from the quake or pose.'" At St. Kilda, I had an opportunity of witnessing the extent to which the human constitution is capable of inhaling a very dense atmosphere. Here, from the scarcity of manure, the usual smoke-hole is dispensed with, in order that the inner side of the thatched roof may be thoroughly saturated with soot. This is annually removed from within, to the depth of a few inches, about an equal amount of straw being laid on the outer roof. Thus the smoke, so far from being an unwelcome occupant, is actually courted and detained.

The general extent to which these smoky huts still prevail along the north-west coast and Hebrides is very great; striking an approximate average for the whole of the above portion of country, I believe I am considerably within the mark in stating, that not one house in ten has any sort of contrivance for carrying away the smoke. In regard to some of the islands, I made especial inquiries in reference to this subject, and found that in Barra, Uist, Harris, and Lewis, the proportion of chimnied houses was not more than 1 in 15—20. In Skye, about 1 in 8—10 would probably possess a chimney, and in some portions of the mainland the number would be still greater, though in certain districts, as, for instance, in Glenelg, the aboriginal hut is almost universal. The prejudice entertained in favour of these dwellings is such, that in some places where chimneys have lately been erected they are not used, the fire being lighted in the middle of the room.

I would now turn to consider what there is given off during the combustion of peat that may possibly keep up a healthy condition of the air cells and mucous membrane of the lungs. First, then, the amount of tar contained in good peat is very considerable. This is sufficiently attested by the oily, unctuous-looking substance which is thickly deposited on the inner rafters of a Highland hut. In hot weather especially, the dropping of the tarry coating from the roof is far from agreeable. Much of the peat found in the Hebrides is especially rich in those resins and ethereal oils which enter into the composition of tar, and with the view of turning them to account a manufactory has been lately established at Stornoway. A certain rough test of the quantity of tar contained in peat may be gathered from the manner in which it is stacked. Thus, in some localities we find it piled up in conical mounds, with a view of excluding the rain, while in others, the upper portion of the mound is left flat and open, and though percolated by the rain the peat still burns brightly.

The treatment of phthisis by the inhalation of different substances, has for many years attracted the attention of medical men. Dr. Harewood, in a short treatise on this subject, remarks that—"In the hands of other practitioners results the most satisfactory have followed the inhalation of the vapours of tar, creosote, &c., whose most obvious and usual effect is that of sustaining the action of the pulmonary exhalant vessels by presenting a stimulus to them, although the stimulus may possibly in reality augment the action of the absorbent vessels also." In the last edition of the 'Encyclopædia Britannica' (vol. xvii.), may be found the results of some experiments of Dr. Letheby, on the solidified peat of Messrs. Gwynne and Co.; the peat prepared by this process is merely partially deprived of its moisture and compressed, not chemically changed. I was informed at Messrs. Gwynne's establishment that some of the specimens examined came from the island of Lewis. Dr. Letheby found the amount of tar 5·14 per cent., and remarked that, in using this peat, "no opaque smoke is evolved," no sulphurous acid is set free, "and the peat does not contain any metallic sulphuret." I have frequently heard the people remark, that they have found it impossible to inhale the smoke of coal to the same extent as peat smoke, which may be due to the sulphurous acid and sulphuretted hydrogen given off by the latter. British coal contains on an average about 1¼ per cent. of sulphur. The late Dr. Golding Bird,* in speaking of the gases given off in the combustion of coal, says that "sulphurous acid gas is always present," and that it is this gas which produces the disposition to irritation about the fauces, and consequent cough, whenever it is permitted to escape and mix with the air of an apartment."

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* Guy's Hospital Reports, vol. iv.

In considering the generally innocuous, and possibly, in the case of certain diseases, the beneficial effects of the inhalation of peat fumes, it is very important to bear in mind the extent to which this fuel is found to differ with the class of plants out of which it is formed, and the situations in which it becomes decomposed. Dr. Macculloch enumerates six kinds of peat, the ground of distinction being based upon the locality in which it is found, and it may readily be believed that "mountain peat, which is rarely more than a foot in depth, and often only a few inches, formed of heather and rushes," should differ from that obtained in lake and marsh districts, which frequently extends to a depth of twenty to thirty feet, and is composed of a distinct order of plants, far more thoroughly decomposed. These differences of situation and formation enable us to understand why it is that one peat contains but a small amount of tar, while others are peculiarly rich in that substance, 4 to 5, or even 9 per cent. being occasionally obtained. The variations in the amount of ash are even greater, or from 1 to upwards of 30 per cent.,* and the specific gravity ranges from 0·3 to 1·1. In addition to tar, peat contains a considerable amount of tannin, to which its remarkable antiseptic properties are attributed. This property is so great that animal substances and even human remains have been found imbedded in peat bogs in a high state of preservation. The tannin, Dr. Macculloch considers to be the produce of tormentilla and some other plants. It may also be due to the oak stems which are frequently met with, especially in forest peat. It contains many other vegetable gums and resins, and the amount of creosote is sufficient in cold weather "to cure" fish suspended from any part of the cottage roof, without the addition of salt.

In attempting to discover the effects of the constant inhalation of such an atmosphere, it appeared to me that some light might be thrown upon the question by instituting a comparison into the relative amount of phthisis met with in chimnied cottages as compared with the smoky huts of the poor. With this view, I solicited information in regard to this particular point, from the different gentlemen whom I troubled with my inquiries. The great majority of them, thirteen in number, inform me that they have either kept no particular account of the class of houses, or that the number of cases altogether seen was so small as to forbid the drawing of any satisfactory conclusion. In the experience of others, the proportionate number of cases seemed pretty equally distributed between the two. Others, again, have found the affection far more prevalent amongst the dwellers in the better class of houses. Thus, Dr. Anderson writes from Tyree, "I have attended nine cases of this disease, and in the house of each of these patients, a chimney conveyed away the smoke. I have not met with one case where the smoke was allowed to find its way through the roof." Dr. Matheson informed me that during his practice in Skye, extending over about twenty years, he had met with some twenty cases, which were, with only two exceptions, confined to chimnied houses. In regard to Ullapool, I learned from Dr. MacGregor that only two out of thirteen phthisical patients of his lived in "smoky cabins." Dr. Trotter, of Dunvegan, gives it as his opinion "that the inhalation of peat-reek night and day by the inmates of these huts, tends very much to health and longevity." Of those cases which have come to my own personal knowledge, and which occurred along the eastern side of Skye, no less than nine out of twelve were in the better houses. Indeed, it was this circumstance which first directed my attention to the possible effects of the peat smoke. There are difficulties, however, in the way of instituting such comparisons, arising from more causes than one. In the first place, there are frequently several intermediate steps between the smoky hut and the modern chimney. In the former, the smoke hole is in a corner of the roof, at a considerable distance from the fire, as if intentionally to detain the fumes. Next we find the fire lighted against one of the side walls, with an aperture immediately above it. Then comes the "hanging chimney," a sort of square, wide-mouthed extinguisher, which is let down from the roof, and conducts much of the smoke away. Finally, we arrive at the ordinary chimney. Another difficulty in coming to a satisfactory conclusion arises from the frequent occurrence of cases in which the disease has been contracted elsewhere, and the patient merely returns to his native land in a hopeless state. Many of my correspondents dwell on this circumstance. Thus Dr. Maclean, of Armadale, who has practised in Sutherland, Ross, and Skye, says that "no less than five out of six of his patients became phthisical when away from this coast; and that any cases of the disease where the patient never left the country, were all of a very chronic character, the disease lasting a very long time." So marked is the antagonism, between some peculiarity of this coast and true phthisis pulmonalis.

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* See Muspratt's Chemistry, part 28.

Another, and perhaps a juster method of testing the value of such fumes would be afforded by comparing the phthisical mortality in peat-burning, as opposed to coal-burning districts, the people, in other respects, as far as possible, living under the same conditions. Such a district we see exemplified in Oban, where coal is in very general use as a fuel. Here, as I learnt from Dr. Campbell, who has practised on the spot for upwards of twenty years, "Phthisis is decidedly common, quite as much so, he believed, as in England and the South of Scotland, many young persons of both sexes dying of the affection." Dr. Campbell further stated that he had been informed by a medical man practising in Morvern, a district in the neighbourhood of Oban, where peat is burnt, that consumption there is of very rare occurrence. The same fact appears from the letters of two of my correspondents above quoted, who reside in the Island of Mull, immediately to the west of Oban. In Greenock, on the other hand, situated some fifty miles in a southerly direction, the proportional phthisical death-rate is higher than in any of the other large towns in Scotland. It is further remarkable that in Iceland and the Faroe Isles, in both of which islands a case of consumption is very rarely met with (as may be seen from the reports of Drs. Schleisner and Panin), the natives do not indulge in the luxury of chimneys, but burn peat in the centre of their huts.

The few inquiries I have made respecting the amount of phthisis that prevails along the north-east coast of Scotland, have all tended to prove that it is far greater than what is met with in any single district in the Hebrides, or western coast. Thus, the Rev. G. Kennedy, of Dornoch, on the east coast of Sutherlandshire, informs me that, "from a register of mortality extending over a period of thirty years, I find the deaths from consumption may be stated at six per cent." This proportion, though lower than the average of England and Wales, is far higher than that of the Hebrides and north-west coast. He goes on to say that "the turf cabins with a hole in the roof are almost unknown at the present time, though formerly they were very general," and speaks of having often heard the old people remark that in their earlier days consumption was unknown. This he had been accustomed to attribute to a change in the people's clothing, with a somewhat more artificial style of living. I have been informed of other places along the east coast where, with the improvement in the dwellings, the disease appears to have become prevalent. The only district to which my inquiries have extended in which the rude cabins are still found, and phthisis appears common, is in the neighbourhood of Rannoch and Athole, in Perthshire. Here, according to Dr. Irwin, who long practised in this part of the country, it is especially met with "among people living in the pure air of higher districts (I am not acquainted with the nature of the peat here used), who might be supposed exempt from a greater amount of such disease." This fact is curious as opposed to Dr. Mühry's theory, that "the occurrence of phthisis diminishes with the atmospheric pressure in vertical elevations."

There is yet another way in which peat may prove a benefactor to the poor Highlander, and that is, as a deodorizer. It is impossible to witness the pools of stagnant water, and impurities of all kinds, that lie in rich profusion about the huts, without a strong conviction that either the baneful effects of putrid exhalations have been grossly and slanderously exaggerated by sanitary reformers, or that here, at any rate, there exists some beneficent agent capable of neutralizing and counteracting them. In the Faroe Isles, where the death-rate is only 1250 in every 100,000 (in the healthiest district in England, it is 1500, and in Liverpool some years ago, it amounted to 3600), Mr. Robert Chambers says, "around nearly every house there is a black and fœtid sewer." Mr. Edmund Davy, in an article in the 'Philosophical Magazine' (vol. xi.), in speaking of the value of peat as a deodorizer for sanitary purposes, demonstrates its capacity for "retaining and absorbing the ammonia of excrementitious matter" in a very conclusive manner. With a view of testing this property, he made cubes of equal size, of peat charcoal, peat dried at 212°, and peat in its ordinary state, and after placing these cubes in receivers filled with ammoniacal gas, obtained the following results, the volume of charcoal or peat being taken as unity.*

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* See also the experiments of Dr. Stenhouse on the same subject: British and Foreign Medico-Chirurgical Review, vol. xvi. p. 151.

Absorption of Ammoniacal Gas.

Peat charcoal, volume	18·2
Peat dried at 212°, volume	33·2
Peat in its ordinary state, volume	50·0

Besides taking up ammoniacal, this substance may prove equally effective in absorbing other deleterious gases. Thus the heap of peat on the cabin floor plays the beneficent part of a most efficient deodorizer, neutralizing and dissipating the noxious effluvia arising from the presence of the cattle, and other equally offensive causes.

As to whether, when tubercle is actually developed in the lungs, or has arrived at a still more advanced stage of the disease, any benefit would be likely to accrue from the inhalation of such an atmosphere, from the very few cases that I have had an opportunity of seeing, I am not in a position to affirm. I have known of one remarkable instance of recovery, on his return to his Highland hut, in a native of Skye, who contracted the disease while residing at Glasgow. Several of my correspondents have expressed themselves astonished at the length of time for which patients who have been sent home to die in their native land, have continued to linger on.

I have thus endeavoured, as impartially as I was able, to give the results of my inquiries and observation on this subject. Along the north-west coast of Scotland, and in the Hebrides, a scattered though very considerable population is still living in one important respect under different conditions to those met with, at least, to so general an extent, in any other portion of Great Britain and Ireland. These conditions, and their possible effects in a sanitary point of view, I have thought it not unprofitable to examine. The whole question respecting the gases given off, and the changes they undergo during combustion, by the different fuels in every-day use, and the influence they exercise on the general health, appears at present but very imperfectly understood. Advancing science will doubtless throw light on much that is now obscure, and it may then appear that the healthy condition of the respiratory organs especially, is more dependent upon the warming and lighting of rooms and towns than is at present believed.

In conclusion, I would remark, that if, from the description I have given of a Highland hut, any may feel disposed to look upon the inmates as still living in a semi-barbarous state, to such I would say, that though the want of personal cleanliness is no doubt much to be lamented, still in all other respects, both as regards morality and education, these people would compare favourably with those in a similar station in the country districts of England and the South of Scotland. From an innate feeling of independence they are slow in giving their confidence and friendship to strangers, and on this account are liable to be misunderstood. It is this feeling which so often leads them cheerfully to undergo for the sake of those who have succeeded in gaining their regard, an amount of fatigue and exertion which would astonish those who have in vain lavished upon them all the allurements of pay. Their general desire to avail themselves of every opportunity of self-improvement is nowhere surpassed, and I would add, there are but few countries in which conversation with the lower orders is more agreeable or instructive than in a Highland bothie.

I would fain take this opportunity of returning to the members of the medical profession, and other gentlemen long acquainted with the Highlands, to many of whom I was personally unknown, the expression of my very sincere thanks for the general courtesy they have manifested in replying to my inquiries. The earnestness which many have shown in discussing this question, and the promises I have received of further information on the particular points to which my inquiries were directed, at the same time that they deserve my warmest acknowledgments, sufficiently indicate the deep interest felt in the general welfare of the people.

ART. II.

On the Morbid Appearances in Death by Cold. By FRANCIS OGSTON, M.D., Aberdeen.

IN a former paper, under the same title, in No. 32 of the 'British and Foreign Medico-Chirurgical Review,' the writer detailed the leading features elicited at the examination of four adults, and as many children, who were believed to have perished from cold. He was induced to do so at the time from the unaccountable absence from medical records of any complete or satisfactory notices of the morbid appearances after death from this cause. With the view of throwing some further light on this obscure subject, he now subjoins an outline of the results of the post-mortem inspections of two additional cases which have recently occurred in his practice.

CASE I.—At five o'clock on the morning of Tuesday, April 24th, 1860, the body of C. R., or J., a vagrant, aged forty-four, sparingly clad, was found, cold and stiff, by the roadside at Kincardine O'Neil, Aberdeenshire, about a hundred yards from the village inn. It was ascertained that at five o'clock on the previous evening, this woman had entered the coffee-room at the inn, and there swallowed half a gill of whisky, and that three hours after she had returned to the coffee-room with a male companion, and shared with him a gill of the same spirit, when both left the inn. The night which followed was very rainy and tempestuous, and the higher grounds in the neighbourhood of the village at the time were covered with snow.

On viewing the body, in company with Dr. Walker, thirty-two hours after its discovery at the roadside, it was lying on its right side in the position in which it had been found, the clothes wet, the arms by the sides, the knees approximated, the left knee fully, the right knee partly bent, the eyelids closed, the pupils natural, the mouth half open, the expression of the countenance placid, and the face, the outside of the left arm, and the fronts of both knees of a bright red hue, contrasting with the pallor of the rest of the surface, the back included, which everywhere showed well-marked cutis anserina.

The appearances at the inspection which followed were as under:—Scalp bloody; arachnoid membrane thickened and opaque; cerebral sinuses empty; blood in moderate quantity in the veins on the surface of the brain; cerebral mass paler, and containing less blood than usual; the cavities on each side of the heart, and the arteries and veins opening into them, distended to an unusual extent with blood, mostly in a fluid state, but mixed with a few red and colourless (fibrinous) clots. The blood in the heart and elsewhere nearly of the hue of arterial blood, and, unless when in bulk, after a few minutes of exposure to the air assuming wholly that appearance. Frothy mucus in the larynx and trachea; mucous coat of the trachea minutely injected; clusters of small petechiæ on the interior of the stomach, whose contents (milk curd) exhaled a spirituous odour; liver a good deal congested; the remaining viscera of the abdomen remarkably pale and bloodless; urinary bladder enormously distended.

Case II.—D. T., aged thirty, a street-porter, left Aberdeen at three o'clock on the afternoon of Wednesday, May 9th, 1860, to attend a fair thirty miles off, walking with six companions by the side of a spring cart loaded with several boxes. He had not advanced more than three miles when a quarrel ensued, in which one of his companions struck him a blow with his open fist, which set his nose a bleeding. The hæmorrhage continued till they reached a wayside inn five miles further on, where they rested about an hour. Here the flow of blood was arrested, and T. partook with his comrades of two gills of whisky and a bottle of ale. He then mounted the cart without assistance, and lay down on the boxes, apparently to sleep, but when the cart was next stopped at Ellon, sixteen miles from town, he was found to be dead. The night of this occurrence was known to be a very cold one.

On proceeding with Dr. Leys, of Ellon, to view the body of T., twelve hours after the discovery of his death, it was found in its original position on its back in the cart, with blood in moderate quantities in the nostrils, and on the face, hands, and clothes, the joints rigid, the arms by the sides, and the knees half bent. Dusky-red patches were observed on the forehead, right side of the face, the chin, the outside of the right and inside of the left thighs, and on the insteps of both feet; with these exceptions, the front of the body, including the lips, markedly pale; dependent parts of the trunks and limbs livid.

At the subsequent inspection the following appearances presented themselves:—Scalp pale; arachnoid membrane thickened and opaque; clear serum, rather abundantly under the arachnoid, in the cerebral ventricles, and at the base of the skull; excepting some fulness of the superior longitudinal sinus, the cerebral veins and sinuses contained but little blood; the mass of the encephalon unusually pale and bloodless; reddish frothy mucus in the trachea, and in considerable quantity in the bronchi; distinct œdema of the left lung; fluid blood in unusually large quantities in the cavities on both sides of the heart, and in the arteries and veins connected with them; and the blood here and elsewhere, as in the previous case, presenting, except when in mass, a rich crimson arterial hue; the contents of the abdomen unusually pale and bloodless; a quantity of brownish fluid, smelling of beer, in the stomach; bladder enormously distended with clear urine.

Remarks.—On comparing these two cases with those of the four adults formerly detailed,* it will be observed that the appearances disclosed at the respective inspections present a close agreement in all their main features. Here, as before, we find the arterial hue of the blood, its collection in unusual quantity on each side of the heart, and in the central bloodvessels, with the comparative deficiency of the vital fluid on the surface of the body generally, and within the head and abdomen; and in addition, diffused patches of redness of the skin on several non-dependent parts. In neither of the above cases were any morbid appearances encountered on careful and minute inspection of every part of the two bodies, which could serve to explain the fatal occurrences independently of the exposures to cold. The small quantity of drinks in each, and the epistaxis in the male, were obviously insufficient for this. So far as they go, then, these inspections, while they correspond with those previously adduced, seem to authorize the at least *probable* conclusion that in all the cause of death was the same. Further observations, it need scarcely be remarked, are wanted before it can be safely assumed that like appearances must necessarily be found in every instance of death by cold, even in its least complicated form. Considerable diversity in this respect presented itself at the inspections of the bodies of the children adduced in the former paper, and the writer has recently found in his notes of the investigation into the cause of the death of an elderly woman, in the winter of 1851, believed to have perished from cold in circumstances very like those of Case II., that while the suffusion of several non-dependent portions of the face, trunk, and limbs was there noted, and the blood was largely collected within all the cavities of the heart, its deficiency elsewhere was not remarked on, and its colour is recorded as being dark in place of bright hued.

ART. III.

Contributions to Teratology: Undescribed Malformation of the Lower Lip occurring in Four Members of one Family. By J. JARDINE MURRAY, F.R.C.S.E., Brighton.

THE object of this paper is to describe a singular malformation of the lower lip which I have found in four members of one family, and which does not seem to have been alluded to by any writer on teratology. I shall describe this malformation, and then consider the various possible explanations which might account for its occurrence. But as other *defects of formation* are manifested among the members of the same family to a remarkable extent, and as I have been afforded every facility for the examination of them, it may in the first place be well to direct attention to the individual peculiarities in the order in which they came under observation.

In May, 1859, Dr. Thomson, Physician to the Royal Maternity

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* British and Foreign Medico-Chirurgical Review, vol. xvi. pp. 485–8.

Hospital of Edinburgh, requested me to see J. H., whose parents were anxious that he should immediately undergo an operation for the cure of hare-lip. The little patient was a well-developed and vigorous child, aged eighteen months. The fissure in the lip was confined to the left side,* but extended quite into the nostril; and on this side, also, the anterior part of the hard palate was cleft from want of union between the intermaxillary bone and the left superior maxilla. The intermaxillary bone was twisted on itself, so that the incisor teeth were placed at an angle to the line of their ordinary direction, and partly bridged over the gap in the alveolar ridge. This twisting caused the portion of the alveolar ridge formed by the intermaxillary bone to overlap that portion formed by the inferior maxilla. The little patient had been brought up at the breast, having been able to apply himself to the left nipple only.

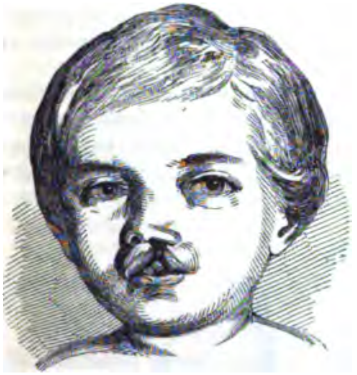

Fig. 1.—J. H. (the eighth child), before operation. The condition of the Mouth is well shown in this woodcut from a careful sketch. The marks on the lower lip indicate the openings of sacculi to be hereafter described.

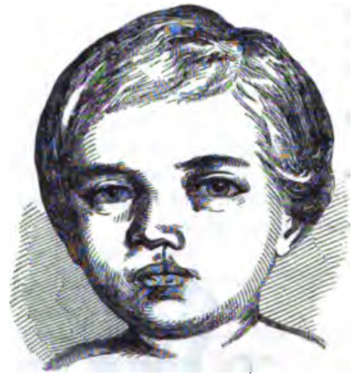

Fig. 2.—The same, some months after operation. As nearly the entire intermaxillary bone has been preserved, the upper lip is normally prominent.

I believe that if the surgeon can choose his own time, in hare-lip he ought either to operate soon after birth, or wait till the child is two or three years old. But in this case there did not appear to be any reason to fear constitutional disturbance from dentition, which had been somewhat irregular. Both parents were extremely anxious that the operation should not be delayed; for the mother was again pregnant, and both she and her husband firmly believed that the daily contemplation of the infant's hare-lip would have such an effect on the mother as to produce a similar malformation in her yet unborn child. With the assistance of my friends Drs. Pow and Messer, I accordingly performed the operation on the 14th May, 1859. After extracting the incisor teeth, I pared off a small portion of the prominent angle of the alveolar ridge, hæmorrhage from the gum being readily controlled by means of a hot wire. I next dissected the lip from the gum for some little distance on each side of the fissure. Then, having put the lip on the stretch by grasping the angle with catch forceps, I removed a crescentic portion from each margin of the fissure, and brought the edges together by means of two needles of soft steel and two sutures of silver wire. On the fourth day the needles were removed, and the cicatrix protected by a layer of collodion. During the following week, the cheeks were supported by a strip of adhesive plaster placed across the face.

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* It is worthy of remark, that Nélaton, Chelius, Fergusson, and others, have observed that in cases of single hare-lip the cleft is usually on the left side. "Vices of formation," such as hare-lip, are properly instances of arrested development, due in the great majority of cases to insufficient formative power in the embryo; and it has been asserted by Otto and others that the left side of the body is not only more frequently the subject of malformations, but that, being weaker, it is also more prone to disease than the right side.

The operation was entirely successful, and afforded the father so much satisfaction that he brought me another of his children, aged three years, who had been born with webbed fingers, and requested me to perform any operation I might think proper for the removal of the deformity.

On the left hand, the middle and ring fingers were closely united as far as their utmost tips; while, on the right hand, the like fingers were joined together by a web which did not extend much beyond the middle joint. It appeared that the bones and tendons of each finger were perfect, and that two fingers were merely wrapped in a common envelope of skin.

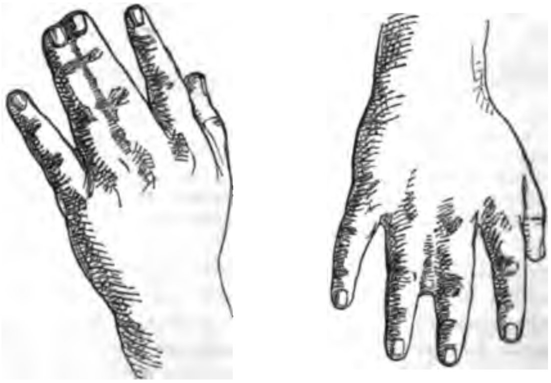

Fig 8.—Left hand. Webbed Fingers. Right hand.
This Boy (the seventh child) was not the subject of any other malformation.

This malformation really consists in absence of fission, and is properly an arrest of development; for in the embryo the rudiments of hands and feet do not at first present any division of the fingers and toes.

I dissected the fingers from each other, and dressed each hand on a Y-shaped splint of gutta percha, the wrist being bandaged to that portion of the splint corresponding with the stem of the letter, and the middle and ring-fingers being respectively placed on the portions representing its arms. Thus, the undesirable re-formation of the web by cicatrization at the angle of divertication of the fingers, which has such a strong tendency to occur in these cases, was effectually prevented. A month afterwards the wounds were entirely healed, the fingers were almost free from stiffness, and the little fellow was using his hands as freely as any child of his age. Neither he nor any of his relatives have webbed toes.

Being now much interested in the peculiarities of this family, I was permitted to examine each of its members in turn; and I am thus enabled to construct the following table, which exhibits in a very striking manner the hereditary nature of physical malformations:—

Father's mother, aged 65 . .	Palate very narrow and much arched.
Father, aged 41	Double hare-lip. Two sacculi in lower lip.
[*]Mother, aged 37.	
First child (girl), aged 17 . .	Two sacculi in lower lip.
[*]Second child (girl), aged 15+.	
Third child (girl), aged 13+ .	Double hare-lip. Two sacculi in lower lip.
[*]Fourth child (girl), aged 11—.	
Fifth child (girl), aged 9+ .	Palate very narrow and much arched.
[Miscarriage.]	
[*]Sixth child (boy), aged 5.	
Seventh child (boy), aged 3 .	Webbed fingers, both hands.
Eighth child (boy), aged 1½ .	Hare-lip (see description and figs. above). Two sacculi in lower lip.

All the individuals alluded to in the above table are free from constitutional disease, and in the enjoyment of excellent health.

The father was born with double hare-lip, and was operated on by the late Mr. Liston. None of his brothers or sisters were thus affected. His mother's palate is, however, decidedly narrow and unusually arched in formation; and while she was somewhat eagerly accounting for the existence of hare-lip in her son, by the circumstance that, shortly before his birth, she had been frightened by an elephant in Wombwell's menagerie, I was forcibly reminded of Mr. Fergusson's remark that—"Often, while listening to a mother's story about some conjectural cause for her infant's deformity of face, he has thought that a glance at her own features in the looking-glass might have given her a more plausible reason for the condition of her offspring."[†]

In the contracted formation of the palate, the fifth child exactly resembles her paternal grandmother.

The seventh child, as already mentioned, was born with the middle and ring finger of each hand closely united by skin.

The eldest child, aged seventeen, is quite womanly in appearance.

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[*] The mother is in every respect well formed, and her second, fourth, and sixth children are also quite normal in development. She does not inherit any tendency to malformations such as are found among her children.

[†] Practical Surgery, p. 584, 1852; p. 564, 1857.

She is in every respect well-formed, save that in the lower lip there are present two pouches or sacculi, which constitute the interesting congenital peculiarity now to be described.

The under lip is full and fleshy. About a quarter of an inch from the external edge of the pink mucous membrane of the prolabium are two crescentic openings, exactly similar in appearance and symmetrical in position, one placed on either side of the mesial line. The horns of the crescent are directed forwards, and a little outwards. A probe inserted into one of these openings passes downwards on the inner side of the lip under a considerable thickness of mucous membrane, to the depth of half-an-inch. Into each pouch a split pea might readily be introduced. The pouches do not communicate with each other; they secrete glairy mucus, and their presence does not occasion any inconvenience.

Sacculi in every respect precisely similar to these are present in the under-lips of the father of this family, and of his third and eighth children, all of whom were, however, born with the additional malformation of hare-lip.

By referring to the portraits of the eighth child (Figs. 1 and 2), the indications of the crescentic mouths of the sacculi may be seen on the prolabium of the lower lip. The two following woodcuts are carefully made from photographs of the father and his third daughter.

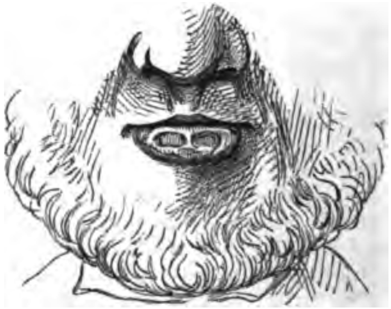

Fig. 4.—The lower portion of the face of the Father, aged forty-one. He was born with double harelip, and at the age of thirteen was operated on by the late Mr. Liston. The prominence of the under-lip is due to the scantiness of the upper lip, which is drawn tightly over the gap caused by the removal of the intermaxillary bone. The crescentic openings of the sacculi on the prolabium of the under-lip are faithfully represented.

How, then, are we to account for this malformation in the lower lip?

1. The malformation is evidently not consequent on the occurrence of hare-lip; for although the father and the third and eighth children were born with hare-lip, and also sacculi in the lower lip, the eldest child has the sacculi in the lower lip very large, while her mouth is in every other respect well formed.

2. The sacculi might possibly be ascribed to the erratic development of tooth-sacs in the under lip. But in all so-called "freaks of Nature" in the human subject, there appears to be an approximation to the normal condition of some one of the lower divisions of the vertebrate animal kingdom; and I am not aware that true labial teeth are present even among fishes.

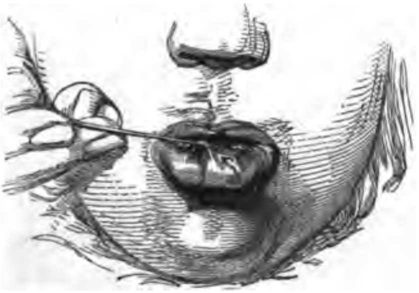

Fig. 5.—The lower portion of the face of the third child, aged thirteen. She was born with double harelip, and was operated on in infancy. The intermaxillary bone has been removed, and the upper lip is tightly stretched over the gap in the jaw thus created. The openings of the sacculi are well shown. The mucous membrane round this opening of the sacculus to the right of the mesial line is represented as it appeared when put on the stretch by means of a probe.

3. The sacculi cannot be ascribed to arrested formation, for in all the four persons in whom they occur there is complete union in the mesial line of the lower lip. And in all mammals, the under lip and lower jaw are developed from two lateral pieces, though the formation is more complex in some reptiles and fishes.

4. Dr. Ormerod has suggested to me, that the malformation may possibly be explained by some peculiarity in the development of the frænum. The crescentic form of the mouths of the sacculi, and their perfectly symmetrical character, render the suggestion well worthy of consideration. But, in other respects, the formation and position of the sacculi do not appear to accord with this explanation.

5. Are the sacculi the result of intra-uterine disease of the labial glands? Some considerations favour this view. Surgeons are aware that the labial, like other mucous glands, are frequently the seat of cystic disease. In the 'Guy's Hospital Reports' for 1859, Mr. Birkett has recorded an interesting case of labial cyst, occupying the middle of the prolabium of the lower lip, a little to the left of the mesial line.*

The peculiarly wide and crescentic openings of the sacculi, however, and the fact that in all four individuals they are so perfectly uniform in appearance and symmetrical in position, seem opposed to such an explanation.

Congenital malformations are sometimes evidently due to disease of the ovum or fœtus, and probably are often to be attributed to the

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[*] Guy's Hospital Reports, third series, vol. v. pp. 266, 267.

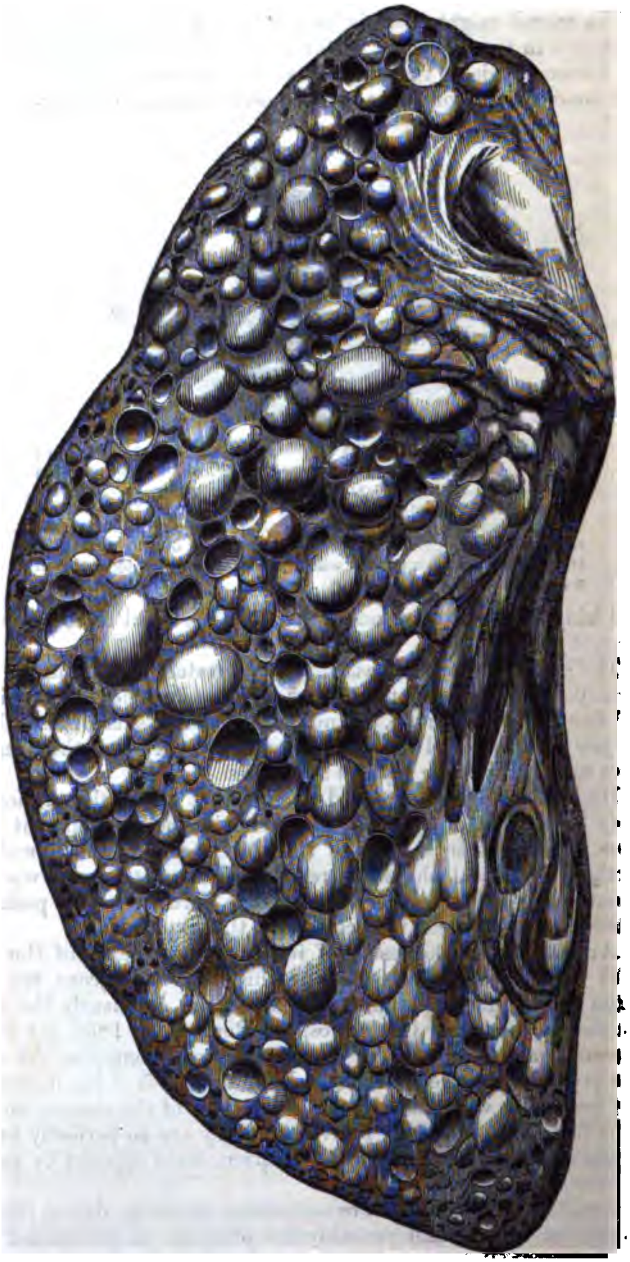

Fig. 6.—Full-size representation of section of the right kidney, showing the enormous development of cysts throughout its substance. The presence of these growths is evidently due to intra-uterine disease of the fœtus.—See the description of this case in the foot-note to p. 509.

male and female reproductive elements having been affected prior to the act of conception; but assuredly the most common explanation is to be found in impeded or arrested development of the fœtus, from some remote or unknown cause. Now, if we suppose the sacculi to be consequent on intra-uterine disease of the labial glands, it is to be noted that in each of three members of the family which forms the subject of this paper, we have two malformations—one (hare-lip) due to arrest of development, and the other (sacculi in lower lip) caused by intra-uterine disease. But there is ample proof that intra-uterine disease may co-exist with arrested development of the fœtus.*

At my request, Professor Goodsir very carefully examined the sacculi; and, while he concurred with me in thinking them extremely interesting and remarkable, he confessed himself unable to account for their existence. I have since communicated with Professor Owen, Dr. Simpson, Mr. Paget, Mr. Green, Mr. Quekett, and others whom I thought likely to throw light on the subject. But I believe that a careful record of facts and description of appearances will better fulfil the requirements of science, than a painstaking advocacy of any one possible explanation of this interesting malformation.

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* Malformations due to arrested development may co-exist with malformations caused by intra-uterine disease of the fœtus. In April, 1857, while house-surgeon in the Royal Maternity Hospital of Edinburgh, I delivered a half-witted girl of a monstrous child, presenting malformations of both kinds. As the case is interesting and illustrative, I may be permitted to insert the following extract from my notes:—

"J. J., aged twenty, has never previously had a child or miscarriage. Labour tedious; after the head and arms had been expelled, the greatly enlarged abdomen of the child remained firmly impacted within the maternal passages, and considerable extractive force had to be employed in order to remove the mass. Patient recovered without a bad symptom. Child still-born, full-grown, female. It is the subject of several malformations. There is what may properly be regarded as spina-bifida of the occiput, arising from deficiency of the occipital bone. On each hand there is an additional finger, but without any additional metacarpal bone. There is fissure of the soft palate. A fleshy tumour is attached to the margin of the tongue. But the most remarkable feature of this case is the enormous size of the abdomen, caused by cystic disease of the kidneys. Both kidneys are affected in a manner precisely similar, and they are of equal size. The right kidney, being carefully dissected from its position, is found to have its vessels and ureter quite normal in size and appearance. The peritoneal covering and the fibrous coat are readily separated from the uniformly smooth external surface of the organ. This kidney weighed 13 oz. ʒ5 ℈9. On making a clear section, the whole substance seems to consist of pearly cysts containing serous fluid. The cysts vary somewhat in size, the average being that of a pea. Other vicera healthy; bladder empty."

Whatever the special pathology of these renal cysts may be—and to discuss the subject here would be out of place—there can be no question that they are consequent on intra-uterine disease of the fœtus; and the tumour on the tongue has doubtless a like origin. The spina-bifida of the occiput and the cleft palate are admitted defects of formation. The redundant fingers and the enormously increased growth of the kidneys are also interesting, as they show that defective development of one portion of the body in the fœtus is sometimes accompanied by excess of development or by increased growth of other parts.

PART FOURTH.

Chronicle of Medical Science.

HALF-YEARLY REPORT ON MICROLOGY.

By John W. Ogle, M.D., F.R.C.P.
Assistant-Physician to St. George's Hospital, and Honorary Secretary to the Pathological Society.

Part I.—Physiology.

NERVOUS SYSTEM.

On the Structure of Nerve-fibres.—Turner[*] continues his observations which, along with Lister, he made upon nerve-fibres prepared with chromic acid and carmine.[†] Portions of an ordinary spinal nerve, hardened in this acid, then immersed in an ammoniacal solution of carmine, then washed with water, and treated with spirit, turpentine, and Canada balsam, were examined in their entire state. In the various fibres, the axial cylinder was seen deeply tinted by the carmine, and could be traced along the centre of the fibre, occupying its middle third, and presenting a sharply-defined outline. The axial cylinder was in none of the cases seen ramifying into the medullary sheaths, as figured by Stilling; and the author considers that the structures described by Stilling as ramifications of the axial cylinder are nothing more than small fibroid particles of the medullary sheath itself, and quite distinct structurally from the axial cylinder; they never receive the carmine colour. Turner also rejects the opinion of Stilling, that a connexion of the different fibres in a bundle exists by means of fine elementary tubules; the only intermediate material between the fibres being an extremely delicate, wavy connective tissue, which, though lying between them, does not form a part of the fibres.

On the Nerves and Ganglia of the Intestines of Mammalia. By W. Manz.[‡] —These ganglia, discovered by Meissner, and doubted by Reichart, are described by the author as being without any special investment, and in the adult as containing large ganglion cells, with small clear nuclei, as well as smaller less characteristic cells (most probably, incomplete ganglion cells) in a connective-tissue structure (gerüst).

From the larger ganglion globules, true as well as false (belonging to the investment) nucleus-holding processes pass. The number of the true processes is very limited. Along with cells possessing no processes, only uni-polar cells were found, and from these the author considers that new nerve-fibre arises in the intestinal ganglia.

The author corroborates the statements of Billroth respecting the plexuses of ganglia consisting of round granular masses without nuclei, in the intestines of the young subject. He agrees with Leydig in thinking that the nerves are developed in pre-existing areolar-tissue elements; the stellate elements would allow of the formation of the plexus, inside which the ganglion cells would originate.

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[*] Quarterly Journal of Microscopical Science, July, 1860, p. 150.

[†] See our former Report, No. 50, p. 516.

Quoted by Recklinghausen in Virchow's Archiv, Band xix. Hefte 1, 2, p, 240.

These observations are in the main confirmed by those of Recklinghausen.

MUSCULAR SYSTEM.

On Transversely-striped Muscular Fibre. By Dr. Sczelkow.[*]—The author was led to make the following observations whilst investigating the subject of the formation of pus in muscle. He reviews the researches of Leydig, who was the first[†] to look upon the small ringlets seen on the transverse section of muscular bundles, as transverse sections of hollow spaces with dentated parietes, which are very similar to areolar-tissue corpuscles, and contain sometimes also rudiments of nuclei; and also considers the cross-striped contractile substance to be inside a sheath of sarcolemma, and penetrated by a system of fine canals or cavities, just as areolar tissue contains the areolar-tissue corpuscles which are connected together. He then alludes to the views of Welcker[‡] and Böttcher,[§] who in the main also come to the same conclusions as the author.

From his own researches, Sczelkow determines that in the primitive muscular bundle of the frog, cell-like anastomosing structures exist, whose nuclei correspond to the so-called muscular nuclei. In a recent condition, these cells are not seen, only the nuclei being visible; but when the muscle is in a state of fatty degeneration, or occupied by pigment, then the cell-like structures may be seen, the fat drops or pigment granules existing in the neighbourhood of the nuclei, which are those recognised as spindle-shaped figures, often connected with each other. They are, however, much more easily recognised in sections of muscle soaked in solution of carmine, and dried, and treated with dilute acetic acid; being seen as reddish bodies with dentated parietes, from which two, three, or four pale processes pass, giving them the appearance of bone-corpuscles. The processes are of variable strength, and either gradually dwindle away as they pass outwards, or they connect two of the above-named corpuscles together; their last bifurcation forming on the transverse section of the muscles a network containing within its meshes the contractile substance. On longitudinal section, in place of the dentate muscular corpuscles, nuclei are seen, in places of a red colour and elongated, from whose extremities vertical projections pass off in the direction of the bundles. Often also two nuclei are seen connected together by these processes; and sometimes a fine line may be seen around the nuclei, which appears to be the contour of the cell-membrane uplifted by the nuclei.

That the muscular corpuscles are veritable cells the author considers proved by the following circumstances. If the muscle of a living frog be so irritated mechanically that pus is formed within it, and then hardened in spirit, we find that changes have taken place as follows. Their transverse markings become lost, they assume a brownish hue, become very friable, and in the place of the corpuscles described above, cells are seen anastomosing with each other very like the areolar-tissue corpuscles of the frog. On carrying the irritation and the formation of pus still further, these cells enlarge, lose their connexion with each other, and become more and more rounded, and are seen to contain elongated or oval nuclei, often in a state of division, and more or less clear finely granulated contents. Whether the muscular corpuscles are in connexion with the corpuscles of the inter-muscular areolar tissue requires confirmation.

On the Growth of Muscle. G. Schmitz.[‖]—The author has been led by observation to the following conclusions :—

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[*] Virchow's Archiv, Band xix. Hefte 1, 2, p. 215.

[†] Muller's Archiv, 1856, s. 156.

[‡] Zeitschr. f. rat Med., Band viii. s. 225.

[§] Virchow's Archiv, Band xiii. s. 227.

[‖] Dissertatio Inaugural, Greifswald. Reviewed in Virchow's Archiv, Band xviii. Hefte 1, 2, p. 174.

1. That by mal-nutrition or obstructed function of a muscle, the number of its primitive bundles is not remarkably diminished.

2. That the physiological growth of muscle is brought about by the formation of new primitive bundles.

The actual enumeration of the muscular bundles, &c., in his observations upon the calf-muscles of the frog under various conditions, upon which his conclusions were founded, is given minutely.

MUCOUS MEMBRANE.

On the Microscopical Characters of the Nasal Mucous Membrane in various Animals and Man. By Hoyer, of Warschau.[*]—This observer had made his investigations on this part of the mucous surface, in the case of man, the sheep, calf, rabbit, guinea-pig, and frog, but especially of the rabbit and the frog. After alluding to the exposition of the various views entertained on this point of minute anatomy, and set forth in the last edition of Kölliker's 'Handbook of Histology,' he especially adverts to the most recent observations—viz., those by Schultze, on the matter. These he had not, however, himself read. He then details at length his own results, which are shortly summed up as follows.

In the nasal mucous membrane of mammalia and the frog are two distinct parts, of different function and structure, the one especially devoted to the sense of smell, in which are ramifications of the olfactory nerve, and the other the ordinary Schneiderean membrane, containing only fibres of the trigeminus nerve. The first of these divisions (the olfactory membrane) is covered by very long narrow cylindrical cells, which in the mammals are free from cilia, but which in the frog, on the contrary, possess exceedingly long fine vibrating cilia; the second division possesses shorter and broader cylindrical cells, furnished with short, quickly-vibrating cilia, between the affixed narrow ends of which, oval and spindle-shaped cells, are inserted, also resting on the basement stratum. The olfactory part in the mammalia contains numerous closely-arranged, simple, pouch-like glands, which are provided with polygonal, yellowish granular cells; these are the well-known glands of Bowman. In the frog analogous formations exist, roundish and club-like follicles filled with round cells. The other, the Schneiderean membrane, is beset with numerous apparently acinose glands, consisting of long spiral pouches containing cylindrical epithelium. A sharp limit exists between the epithelium and basement structure both in the olfactory and the other part of the nasal membrane. As respects the olfactory nerve, it is described by Hoyer as dividing into fibres, with a homogeneous, finely-granulated contents; containing either in their interior, or in their sheaths, short rod-shaped, numerous nucleus-like formations. They may be traced up to the surface between the glands of Bowman, and are seen losing themselves close under the epithelium. Hoyer had never been able to make out anything definite as to their actual termination.

In connexion with this subject, see our Report of Ecker's 'Observations on the Olfactory Mucous Membrane of Man,' in the October number, 1857, p. 511.

GLANDULAR SYSTEM.

On the Anatomy of the Lenticular Glands or Follicles, and the Lymphatic Glands. By J. Henle.—This writer,[†] after alluding to the well-known observations by Brücke upon the comparison between the solitary and Peyer's glands of the intestine and those of the lymphatic system, proceeds to show the similarity, on the one hand, between the lenticular glands of the intestine and of the stomach, the Malpighian bodies of the spleen (or even the entire spleen itself), the glands at the root of the tongue, the tonsils, the thymus, certain conjunctival glands, and the lymphatic glands, on the other. He warns against the supposition that the group above-mentioned are to be considered as lymphatic glands, inasmuch as in the lymphatic glands the branches of the afferent lymphatic vessels spread inside the glands, and again the lymphatic branches coalesce into the efferent vessels; whilst this anatomical characteristic is entirely wanting in that group. He then mentions the doubtful results obtained by Brücke in his attempts to show the connexion between the intestinal glands and lymphatic vessels, and also the failure of Hyrtl,* in the same respects. To proceed to his description of the anatomical arrangement of the structures above grouped together along with the lymphatic glands, all of which he terms conglobate glands,—he says they all consist of a net-like areolar tissue, permeated by vessels in whose meshes globular corpuscles, connected by a more or less adhesive fluid material, are contained. The walls of the areolar network are of variable strength, the meshes more or less narrow, and more or less regular. Occasionally the network at the periphery of a clump of corpuscles is compressed into a membrane or species of capsule. A structureless capsule comparable to the tunic of acinose glands does not exist. The appearance of such a structure only arises from the superficial coagulation (owing to contact with water) of the contents projecting through the rents and holes in the areolar investment.

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[*] Reichert and Du Bois-Reymond's Archiv, 1860, Heft 1, p. 50.

[†] Henle and Pfeuffer's Zeitschr., 1860, Band viii. p. 201.

As regards the corpuscles, Henle describes them as being, when fresh, of a darkish contour, but when in distilled water, as being almost invisible, and becoming dark and almost granular when immersed in concentrated acetic acid, in chromic and sulphuric acid, and in glycerin; whilst in dilute potash solution they are gradually dissolved, and in concentrated potash solution immediately converted into a finely granular fluid substance. When in close proximity to the deepest layers of mucous membrane, the glandular corpuscles are seen to differ from the nuclei of those layers by their less regular arrangement, and smaller size; but in the areolar layers which in most cases separate the epithelium from the follicles, and is to be looked upon as the true mucous membrane, acetic acid reveals single corpuscles very like those which compose the follicles. As regards the mode of origin or development of the corpuscles, Henle had observed nothing definite; but remarks that great varieties in size of the corpuscles exists (the diameter of the nuclei varying from 0·005 to 0·01 millimetres) and that the nuclei exhibit rents and loopings as if they were engaged in division. Nuclear forms of several shapes, and containing a variable number of nucleoli, are seen after the gentle action of diluted acetic acid.

The author next considers the relation of the blood-vessels to the parenchyma of conglobate glands, and after detailing the views of Frey, Kölliker, Bruch, Stromeyer, Jendrássik, &c., proceeds to give his own observations. He states that the capillary network inside the parenchyma is not remarkably characterized, the vascular network in the intestinal and tracheal glands being most regularly and completely capillary; while sections of the Malpighian vesicles of the spleen often show no capillary vessel, but only an arterial and a venous branchlet at various distances from each other. Thus also the acini of the tonsils and lymphatic glands contain numerous branchlets of large calibre; the arterial branchlets being known by their strength and the character of their walls. The capillary network is recognisable by the well-known nuclei which disappear in specimens prepared with diluted potash solution. In the pancreas of some animals and in lymphatic glands of man, sections of vessels are met with, looking like areolar tissue cavities, surrounded by a special membrane, which are probably the openings of lymphatic vessels. The author then proceeds to the consideration of the fibrous network of the conglobate glands;—enumerating the opinions of a great number of observers, most of whom he thinks have committed errors in their observations by reason of their method of preparing their specimens. For instance, the hardening of glands in chromic acid, whilst it has undoubted advantages, yet destroys the difference betwixt the fibres of elastic and areolar tissue, rendering the latter darker and more resisting, whereas by means of acetic acid and diluted potash solution, the net-like stroma becomes pale. Again, many observers had altogether mistaken the nucleus-looking objects seen here and there in the walls of the meshes, especially at the knotted parts of juncture for areolar tissue corpuscles, whereas these are in reality only the circular or elliptical sections of areolar tissue bundles and capillary vessels at right angles to the eye, the appearance of a nucleolus being owing to elastic fibre passing through the axis of the bundle, or to the contents of a vessel, as very careful adjustment of the lens will show. Moreover, these apparent nuclei of the areolar tissue are unacted upon by solution of potash, as the corpuscles of glandular parenchyma are; whilst acetic acid, which intensifies true parenchymatous corpuscles and nuclei, destroys the appearance of any cellular network. The author agrees with Heidenhein in repudiating the view entertained by Eckard that the connective-tissue, trabeculæ of the network, were a kind of serous vessels projecting from the finest blood-vessels; the hollow trabeculæ, when existing, being in fact only the emptied and collapsed capillary blood-vessels; neither does he agree with Leydig that the scaffolding of conglobate glands is necessarily the unravelled connective-tissue membrane of the vessels. This he allows to be so in some cases, as in the case of the Malpighian bodies and the spleen; but he thinks that any portion of network may become a conglobate gland by reason of the deposit therein of structures like lymph corpuscles. In connexion with this subject he details his method of making his preparation, and states that the glandular part of the conjunctiva of domestic animals is the most suitable structure for observation. He then describes fully what is to be met with in such preparations, following the various changes which take place in the formation of the follicles, the looping of the vessels, &c. He protests against there being any continuous investment of the follicles, and asserts that not only are conglobate glands wanting in a cyst, but that the rounded, pouch-like appearance is a mere accident, and often only confined to the superficial parts; the characteristic of these glands being merely that there is an infiltrating substance, allied as to its plasma and corpuscles to those of lymph, and a connective-tissue capable of being infiltrated in proportion to its looseness and porosity.

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* Lehrb. d. Anatomie. 6 Aufl p. 573.

On the Glands at the Root of the Tongue. By A. Böttcher.*—The author, after referring to the arguments which have been upheld *pro* and *con.* regarding the supposed existence of closed follicles at this part of the tongue, proceeds to detail the descriptions given by most observers of the minute characters of these glands. He asks how it is that such different estimates are given, not only as to their number and arrangement, but also as to their size and the character of their excretory duct. This difference the author determines not to be accidental, but distinctly referrible to the condition of the mucous membrane. He then describes at full length the minute anatomical character of several tongues which he removed from the human body after death (which we will not detail here), and by which he shows that several special kinds of difference may be recognised. From his observations he deduces:—

1st.—That there are tongues which possess no so-called follicular glands at all. 2ndly. That very small follicles make their appearance along with disease of the mucous membrane. 3rdly. That between both of the above there are intervening conditions which render it difficult to determine whether an elevation of the mucous membrane of the tongue with a glandular canal in the middle has not been mistaken for a follicular gland. These facts, the author says, render it a matter of question whether the follicular glands are not the result of pathological changes; and accordingly, from his microscopical observations, which are too lengthy for anything more than a mere abbreviation, he establishes that normal tongues contain no follicular glands, excepting such as are produced by morbid swelling in the neighbourhood of the ducts of the mucous glands. Thus he shows that around the outlets of these ducts, the mucous membrane around becomes much swollen, partly closes up the duct, and in this way gives rise to a cavity. The papillæ of the swollen membrane become enlarged, and masses of new formations take place in it. Subsequently the excretory duct becomes closed, excepting that part of it which, when distended, is formed into a cavity lined by epithelium, the now definite material forming the so-called follicles, which become surrounded by an investment, and which eventually burst into the newly-formed cavity. Thus is eventually constructed the so-called follicular gland.

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* Virchow's Archiv, Band xviii. Hefte 3, 4, 1860, p. 190.

PART II.—PATHOLOGY.

MUSCULAR SYSTEM.

On the Trichina Spiralis. By R. Virchow.[*]—The author states that in the year 1859 he had met with the unusual number of six cases of this affection, which fact he appears to attribute rather to careful search for such instances than to their having been more frequent than ordinary. These parasites were most abundant in the muscles of the larynx, and most infrequent in those of the tongue and diaphragm. They were never met with in the substance of the heart (as are the cysticercus and the echinococcus), a circumstance which Virchow thinks dependent on certain chemical peculiarities of the heart's muscles. After minutely describing the general characters, nature, and appearance of the trichina and its cysts, with especial allusion to the observations of Luschka,[†] Bischoff, and Valentin,[‡] Bristowe and Rainey,[§] &c., he passes on to their more minute composition. He alludes to the fact that in many cases the spindle-shaped cysts containing the animal are of a greyish-white colour, owing to calcareous deposit in their walls, which does not, however, as in the case of the cysticerci and echinococci, imply the previous death of the animal, inasmuch as in many instances completely living ones are met with in the interior. Again, speaking of the dust-like masses of elementary corpuscles which Luschka described as being within the cysts, and as containing small round or elongated bodies, he declares these last-named bodies to be undoubtedly nuclei, which on separation are seen sharply and darkly defined, and to contain one or two nucleoli. He is also disposed to look upon these nuclei as nuclei of the primitive muscular bundles into which the animal has found access; the granular masses being disintegrated muscular substance, and the cyst wall the thickened sarcolemma. The author describes the animal not only when removed from its capsule but also when irritated, *in situ*, as possessing powers of movement: the movements consisting of a widening or narrowing of the spiral in which it is rolled, of lateral motions of the head and digestive canal. He then goes on to state that his observations on the composition of the animals agree in many respects with those of Luschka, and Rainey, and Bristowe, but not in all points; and it is rather in reference to the difference between them than to any full description of the parasite that the author's observations are made.

[*] Virchow's Archiv, 1860, Band xviii. Heft 4. p 330.

[†] Zeitschr. f. Wissen. Zool., Band iii. s. 70.

[‡] Report f. Anat. u. Phys., Band vi. 1841, s. 194.

[§] Transactions of Pathological Society of London, vol. v. p. 277.

He describes as existing inside the homogeneous and vitreous-looking investment, along the entire length of the body, a transparent, mostly empty canal, which, however, is in many places not visible, by reason of its being overlapped by other organs. He then quotes the observation of Luschka and Küchenmeister upon the anatomy of the animal, who state that the central digestive tube is in places sacculated and contracted by transverse loops. The round dots which Luschka describes upon the out-bulging parts, and which Küchenmeister looks upon as the results of an optical delusion, he considers to be veritable nuclei. He has never met with the roundish and oval-shaped nuclei figured by Luschka, except in the anterior third of the animal, whilst towards the end of the second third he observed smaller glittering fat-like points or grains at regular distances. He altogether differs from Luschka as to the structure in which these nuclei and grains are deposited; for he has satisfied himself that the outer limit is not the outer limit of the digestive tube, which is to be seen inside as a transparent tolerably homogeneous cavity, and this very clearly at all parts except at the anterior part of the animal, where the nuclei are surrounded by a granular mass. Virchow had never met with any division of the investing structure, the fore-part of which appeared to consist of large cells closely pressed together, which posteriorly became shorter and broader, their contents being more transparent, and their nuclei dwindling away, and glittering granules appearing. The hinder part of the organ has the appearance of a small artery with very thickened walls.

Virchow then proceeds to comment on the observations made by Owen, Davaine,* Herbst,† Schneider, Küchenmeister, Leuckart, &c., as to the effects of feeding animals with flesh containing the trichina, and as to the relation of this parasite to other entozoa. He gives a short description of the results obtained by himself from feeding a dog with such food. The dog died three and a half days afterwards from an injury, and the intestinal villi were found to be beset with psorosperms, and in the intestines also great numbers of delicate transparent thread-worms, having generally the form of the trichina, but larger, and possessing complete sexual development. These he minutely describes; and concludes, from observations on their ova and on the formation of their genital organs, that they have no identity with the trichocephalus dispar.

Some observations also of Leuckart on the trichina spiralis are to be found translated in the 'London Microscopical Journal,'‡ in which he states that, as Virchow has shown, the trichina in the intestine of the dog assumes in a very short time the condition of sexual maturity, but independently of a previous transformation into any already known form of thread-worm. In the same journal is a further quotation of Leuckart,§ in which he states that the trichina as met with in muscle represents the immature condition of a nematoïd worm, which becomes fully developed in the intestines of man and fowl, attaining maturity in about two days after its introduction. It is viviparous, and the small filaria-form embryos, which are produced in about six days, immediately commence their migration by penetrating the walls of the bowel in order to reach the striped muscular tissue. The greater number of the embryos remain in the muscles surrounding the visceral cavities, the muscular fibres of which they reach, and in about fourteen days assume the size and structure of the trichina.

Case of Congenital Hypertrophy of the Tongue. By Dr. R. Volkmann.—After allusion to the literature of hypertrophy of this organ, and especially the dissertation in 1845 by Leuw, 'De Macroglossia seu Linguæ Prolapsu,' noticing, too, its frequency amongst cretins and the imbecile, he relates a case

* Traité des Entozoaires. Paris, 1860.

† Göttinger Nachrichten, 1852. No. 12. s. 183.

‡ July, 1860, p. 168.

§ Göttinger Nachricht., April 30th, 1860.

from the clinique of Herr Blasius. On microscopical examination of the extirpated part of the tongue, it was found that a considerable growth of intermuscular connective tissue existed. The fibrous texture accumulated in the middle of the tongue consisted mostly of very developed and evidently fibrillated, occasionally more granulated, areolar tissue, while in all directions the smallest fat-drops and fine dark molecules existed, and, as shown by addition of acetic acid, very numerous areolar-tissue corpuscles. The muscular bundles and fibres of the tongue showed nothing unnatural, neither did the nerves and blood-vessels. The author alludes to the microscopical description of this kind of diseased tongue by Weber and Virchow, the last of whom details two cases. In one of them, from a child, amongst the intervening areolar tissue numbers of endogenous new cell-formations existed, accumulated together in groups; these passed into cyst-like spaces, apparently having some relation to dilated lymphatic vessels. In the other case, also from a child, besides hypertrophied intervening areolar tissue, there was a widening and thickening of the vessels and their walls, so that an almost cancerous structure was induced. In another case of a man, the development of a firm fibroid tissue was seen, but no dilatation of the vessels.

GLANDULAR SYSTEM.

On Fatty Liver. By Dr. Lionel Beale.[*]—The author describes the microscopical appearances of a specimen of fatty liver taken from the body of a girl who appeared to have died from exposure and want of food. In this specimen the appearances differed from those of any which he had previously examined. Generally, as in the fatty liver of phthisis, the fatty matter is deposited chiefly in the oldest cells, those, viz., at the portal aspect, or circumference of the lobules which receive the first rich portal blood, where the circulation is slowest and where the secretion of bile is most active; and it is at this part of the lobule that the changes in cirrhosis first occur.

The writer calls to mind the fact that the youngest cells are found nearest to the centre of the lobule, their development and multiplication taking place near the hepatic vein where the circulation is most rapid. In the present case, in which the body was remarkably free from fat, the presence of the fatty matter in the hepatic lobules could not be attributed to a large amount of fat in the portal blood, to any increased nutrition of the cells, but it was apparently due to changes affecting the development and early growth of the cells The substance which possibly ought, under normal conditions, to have been converted into material of which the cells are composed and from which the bile is formed, appears to remain in a crude state, and assume the form of fat globules.

MISCELLANEOUS.

False Membrane in Diphtheria.—In several good cases Dr. Beale[†] could find no traces of fungi. In one specimen in which vegetable organisms were discovered, they were proved to be of accidental presence. The membrane seemed to be delicately fibrillated in its entire thickness, and contained a number of small faintly-granular corpuscles. In some cases the membrane was quite composed of cells, which closely agreed in character with pus-corpuscles.

Several interesting cases illustrating the general and minute structure of the diphtheric membrane may be seen in the last volume (No. x.) of the 'Transactions of the Pathological Society,' pp. 311-334.

Liquor Amnii containing Urea and Casts of the Uriniferous Tubes.[‡]—Urea, to the extent of 3·50 per 1000, was found in this specimen, and also casts of the uriniferous tubes of the fœtus, proving that the urine becomes mixed with the liquor amnii during the later months of pregnancy.

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[*] Archives of Medicine, No. 5, p. 41.

[†] Archives of Medicine, No. 8, p. 242.

[‡] Ibid., No. 2, p. 137.

Dried Blood.—Fleming,[*] in a forensic article on blood-stains, among other points speaks of the microscopical appearances of the corpuscles of the blood when desiccated. He says that after this process has taken place the white corpuscles become totally destroyed, and that they cannot be reproduced in a normal state, thus confirming the statement of Robin, who says that in blood which is drying these white corpuscles alter in shape, and that they break down and their contents escape. This statement is in opposition to that of Wyman,[†] who states that on the addition of water to dried blood the "lymph" corpuscles become visible, containing granules.

Circular Sporules in Urine closely resembling Blood corpuscles.[‡]—The urine was acid, containing many sporules closely resembling, in form and size, the red blood corpuscles. Many bodies were observed with a point in the centre, and larger than a blood corpuscle. This resemblance could, of course, not be a source of deception in cases where the blood-corpuscles were numerous, as then albumen would be detected. In this case, no albumen existed. In doubtful cases, time will bring about the germination of the sporules. Moreover, blood-corpuscles can always be distinguished by the ragged edges which form on maceration, and by the difference of their refractive power; and the circular crystals of oxalate of lime, not unlike these sporules, are unaltered by remaining in the urine.

Petrified Spermatic Fluid. By O. Beckmann.—The specimen described consisted of a roundish, roughened, and yellowish body of about the size of a cherry-stone, and was removed from the ejaculatory duct. On section, a yellowish-white crumbling centre or nucleus, of the size of a hemp-seed, was found surrounded by a brownish-yellow zone, which again was surrounded by the superficial pale yellow substance. The nucleus consisted of a number of small roundish or irregular fragments. On the addition of acids, a quantity of gas was liberated, and organic substance of the original form remained. No difference was observed between the two layers composing the body. Hydrochloric acid was found to dissolve the inorganic part quickly, with the evolution of carbonic acid, and lime, and phosphoric acid, and traces of magnesia were found in the solution. The organic *débris* was tolerably soft, and could readily be separated into small laminæ; it was found to consist almost entirely of seminal corpuscles retained in connexion by a homogeneous material insoluble in acetic and hydrochloric acid, and slowly affected by alkalies. The spermatic bodies were more visible after the addition of an alkali.

Bodies resembling Spermatozoa from the Urine of a Woman.[‖]—These bodies were found by Dr. Beale in the urine of a patient of Mr. Cæsar Hawkins's, in St. George's Hospital. Many of the organisms were exactly like spermatozoa, and might certainly have been mistaken for them; but on examination of a number of specimens, it became evident that they were really vegetable organisms. This fact is one of great interest and importance with reference to questions of supposed rape. Dr. Beale had never before met with structures liable to be mistaken for spermatozoa.

Amyloid Bodies.—A paper on these interesting substances by Friedreich and

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[*] American Journal, January, 1859, p. 84.

[†] Report on Case of J. Webster, p. 90. Boston, 1850.

[‡] Beale's Archives, No. 5, p. 49

[‖] Beale's Archives of Medicine, No. 8, vol. i. p. 251.

Kekulé contains[*] the details of a case in which a quantity of this material was isolated and submitted to chemical analysis. The authors preface the case by allusion to the view that these concentric bodies arose from the coagulated fibrine of extravasated blood, which underwent chemical change; and especially to an instance of a hæmatocele, operated upon by Linhardt, in which the cyst wall was covered by layers of altered blood coagulum, which had undergone amyloid transformation in a remarkable way. The case related was that of a woman, aged thirty-six, who for a long time had been subject to tertian ague, ascites, anasarca, albuminous urine, and enlarged spleen. After death, among other things, the cranial bones were found thickened, and at the vertex exhibited a flat exostosis; the liver was shrunken, its capsule being irregularly thickened. The spleen, besides being large, was of a waxy consistence, in which was an irregular portion of the parenchyma converted into a bloodless mass, of a whitish or whitish-yellow colour in the centre, and greyish-white toward the circumference. The thyroid gland contained old and fresh tubercles, and the end of the ileum and the cæcum were slightly ulcerated. Moreover, cicatrices of the gums, throat, and vagina were found. On microscopical examination, the amyloid degeneration was found to have proceeded in the walls of some of the hepatic bloodvessels, but not at all in the parenchyma of the liver. In the wax-like part of the spleen, the cells, the trabecular work, and the bloodvessels, this degeneration had taken place to an extreme degree, and the central white part was found to owe its colour to much finely granular fat, the result of fatty degeneration of the areolar-tissue-corpuscles of the trabecular work. In the kidneys much amyloid degeneration of the vessels and glomeruli existed, and this was the case also with the bloodvessels of the uterus, the uterine and vaginal mucous membrane, the heart, &c., but in the muscular structure of the heart and uterus, in the vessels of the lungs and brain, &c., this change had not gone on. This change was also found in the minute bloodvessels of the intestinal mucous membrane, and slightly in those of the stomach; also in the villi of the small intestines, and to an excessive degree in the above-mentioned ulcers of the intestines which appeared to be destructive processes set up as a result of degeneration of the nourishing bloodvessels. The authors here allude to a case of almost entire deficiency of the intestinal villi in a case of amyloid degeneration, related in another place,[†] and also one related by Beckmann,[‡] in which destruction of the mucous membrane of the intestine existed to a great extent. They look upon the case above related as an instance of amyloid degeneration, in connexion with an inveterate syphilitic taint, such as have been already noticed.[§] A review is then made of several theories entertained by Virchow, Bush, Donders, Moleschott, Naegeli, &c., as to the chemical nature of the so-called amyloid substance, and especial reference to that of Meckel, that the blue substance yielded by the addition of iodine and sulphuric acid is owing to cholestearine, a view shown by Virchow to be untenable. Allusion is also made to the negative results obtained in various attempts to convert this amyloid substance into sugar. The paper closes by the description of a chemical analysis of portions of the spleen, which were found to consist almost exclusively of amyloid substance, enabling the authors to come to the following conclusions, at any rate, with regard to the amyloid substance there formed—viz., that although a large quantity of cholestearine is contained, yet this is by no means the cause of the iodine or sulphuric acid reaction; also that the waxy spleen contains no bodies which chemically resemble either amylon or cellulose. These so-called amyloid substances appear to be only modified and altered albuminous material.

On the Corpora Amylacea in the Prostate Gland.—The author of this communication,[||] Paulizky, of Berlin, treats at length of the laminated structures which almost always are to be found in the prostate of the adult. These bodies appear in all points to agree in their earlier conditions with vegetable starch granules, possessing the same morphological, physical, and chemical properties; and both agree in becoming converted into sugar by the ferment of the saliva, as tested both by the Trommer's test, and by fermentation. All prostatic amyloid deposits do not, however, show these properties in an equal degree. As the amyloid bodies grow, and become the seat of calcareous and pigment deposits, so does the starch entering into their composition gradually disappear, until at last none whatever exists. In their earlier stages these prostatic amyloid bodies are partly round, colourless, and generally quite homogeneous, with a peculiar waxy look, having a dark outline; at times they contain some fat granules, or have a slightly granular look. In like manner young starch granules are homogeneous, but chiefly club-shaped, like those corpora amylacea found in the nervous system.

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[*] Virchow's Archiv. Band xvi. Hefte 1, 2, p. 50.

[†] Virchow's Archiv, Band xi. s. 391.

[‡] Ibid., Band xiii. s. 97.

[§] Ibid., Band xi. s. 393, and Band xiii. s. 498 and s. 500.

[||] Ibid., Band xvi. Hefte 1, 2, p. 147.

Along with the homogeneous ones others slightly laminated may be seen, and in various cases the gradual assumption of a complete concentric lamination may be watched as the bodies grow, which they may do to such an extent as to be visible to the naked eye. In some prostatic bodies a distinct cell, or number of cells, are to be seen. Sometimes the central part is homogeneous, whilst the outer parts are laminated, and sometimes these bodies are full of fat granules or drops. At times as many as twenty or thirty small structures are united into a single concretion by common lines of lamination.

These amyloids are not seen in the prostate of children, but seldom fail in the adult; in hypertrophy of the prostate the formation of these concretions does not always co-exist. The larger bodies lie chiefly in the excretory ducts, but the small ones in all parts of the gland. In cold water, alcohol, or ether, the bodies remain unchanged, but in hot water or in solution of mineral acid and alkalies they swell out and finally dissolve. As regards their change of colour on the addition of iodine to the smaller and younger bodies, they vary considerably, and may be wine-red, or a light, clear blue, or a dark blue, or indigo blue, or black blue, and almost black, owing to the length of time during which they remain in contact with the iodine solution, and partly owing to the interference of other elements. Often the central part of the body only becomes coloured. Sometimes a copper red or a brown red is produced. In fact, the colour may vary on the addition of iodine, just as that of various kinds of vegetable starch does, according as the starch or the cellulose preponderates, the first one being of a blue, the second of a brownish-red colour; this is in accordance with statements of Naegeli, who looks upon all starch granules as consisting of an intimate mixture of cellulose and starch. In like manner also, as cellulose is converted by sulphuric acid into starch in vegetables, and then is capable of being turned blue by iodine, so in the prostatic amyloids, which give a brown red colour when iodine is used, a blue colour is brought out on conjoining sulphuric acid with it.

But in the prostatic amyloids we also have other colours, varying between blue, green, and yellow; and this is the result of albuminous compounds which become pale yellow by addition of iodine, and so vitiate the pure colours before spoken of. Again, modifications of the iodine colours are produced by saline and pigment matters, as also, in fact, by the degree of concentration and quantity of the iodine solution itself, the slighter the dilution the clearer being the colour produced.

These bodies seem to arise, in the first place, from the proper cells of the prostate, which regenerate, and which, even before ulterior alteration, may be seen coloured blue or brownish-red by iodine, but capable of becoming again colourless on the addition of water. Subsequently the nucleus is seen to swell out, lose its granular look, and become fused with the cell contents, forming a homogeneous structure, which assumes a waxen look and may attain a very large size. In the case of the rabbit, the termination of glandular pouches may be seen coloured blue, whilst the cells of the other parts only possess the ordinary yellow colour; the coloured cells being in some cases fused together, in others not so. The further progress of these bodies formed from cells seems to consist in a deposit from the surrounding fluids of a substance which has similar chemical properties to these bodies, which then grow by outward accretion.

But, besides the prostate gland, the mucous membrane of the genital apparatus will often be seen to possess these amyloid bodies, as in the bladder, vagina, urethra, and they may be met with in the "URINE." In the lower animals, also, they are found in the prostate, as in the rabbit, horse, dog, &c.

The question of "AMYLACEOUS BODIES" is the subject also of a long communication to the Pathological Society of London (vol. x. p. 299) by Dr. Bristowe and Mr. Ord, for the analysis of which we, however, have not room in the present report.

On Sarcina Ventriculi. By Dr. John Lowe.*—In a short but interesting paper on this subject, the author considers the following points of inquiry, which have been originated with respect to it:—1st. As to the origin of the sarcina. 2ndly. As to its source. 3rdly. As to its pathological relation to the affection in which it is found to occur. 4thly. As to the reason of its continuing to flourish in a locality so unfavourable to the development and nutrition of a vegetable organism.

As regards its nature, the author coincides in the view that it should be classed as an algal condition of a common fungus.

As regards its source, it seems to him most probable that the sarcina pertains to one of the common fungi penicillium or aspergillus, as suggested by Mr. Berkeley.† This probability was increased by the discovery of quaternate cells on a yellow fungus found growing on bone by Mr. H. O. Stephens. Then, again, the author demonstrated to the Botanical Society, in 1857, that parasitic fungi were derived from the above-named genera; and Dr. Tilbury Fox showed the presence of sarcina in a case of parasitic skin disease. Moreover, the author had met with perfect specimens of sarcina in a phial, which for some months had contained a quantity of cholesterin for a hydrocele. The author thinks there is no fungus infesting either the human or any other animal body which is not derived from one of the common genera—penicillium, aspergillus, and mucor.

As respects the manner in which the sarcina enters the lungs or kidneys, he considers, with regard to the lungs, that the spores of the fungus are carried into them during inspiration, then undergo development, and give rise to a mycelium, which may produce fructification; as regards the kidneys, they appear to find entrance through the circulation, but as it cannot get into the circulation, either as a sarcina, nor yet as a spore, owing to their comparatively large size, Dr. Lowe supposes that they take origin from exceedingly small cellules ($\frac{1}{10000}$th of an inch in diameter) produced by the division of nuclei liberated from the fungi, which cellules may find access through slight lesions of the vessels of the mucous membrane.

Again, as respects the relation of sarcina to the disease in which observers suppose it to occur, Dr. Lowe considers that some pre-existing disease of the stomach, by which its secreting power is diminished, is necessary for the formation of a nidus for the fungus, which increases the irritation of the organ by its contact, or by the excitation of fermentative decomposition, the products of which fermentation by distension and irritation cause efforts at vomiting, and the yeasty appearance of the ejection.

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* Gardener's Chronicle, August 29th, 1857.

† Edinburgh New Philosophical Journal, July, 1860, p. 58.

Finally, that the plant should be retained in the stomach in the form of sarcina appears to the author due to the presence of the hydrosulphuret of ammonium.

The author does not consider the sarcina to be the spore of the plant, as does Mr. Berkeley, inasmuch as it is not apparently the result of a true reproductive process, but of a gemmation or fissiparous division, just as yeast is owing to the gemmation of a fungus.

Microscopical Observations on the Water of the Baths of Ems. By Dr. Spengler.[*]—After alluding to the beneficial effects possessed by these waters over certain chronic affections of the mucous membrane of the throat and nasal cavities, the author proceeds to attribute their properties not only to the warmth, the mineral components, and the carbonic acid contained, but also to certain forms of vegetable and animal life in which the waters abound. According to him, these waters possess the power not only of freeing the mucous membrane from the thick mucus which clogs it, but also of restoring and quickening the vibratile movement of the epithelium of the throat. This supposed fact accords with the experiments of Virchow, who found that dilute alkalies excite vibratile action. The author also states that the water of Ems has the faculty of quickening the movements of spermatic bodies, as may be seen microscopically on applying it to the sperma of the frog, in which the movements have become tardy or arrested, even in the case of the dried sperma. This explains to the author's mind the beneficial effects attributed to this water in cases of barrenness. He alludes to the statements of Donné, that the acid reaction of the mucus of the vagina and the uterus has an injurious effect on the motion of the spermatic threads, and suggests resort to the use of alkalies and of alkaline vaginal injections to promote conception. He then refers to the discovery of microscopic plants (*gallionella ferruginea* of Ehrenberg, &c.) in the mineral waters of Ems, as Schultz has already described; and also of two kinds of infusoria—viz., the ordinary vorticella and varieties of navicula.

HALF-YEARLY REPORT ON FORENSIC MEDICINE, TOXICOLOGY, AND HYGIENE.

By Benjamin W. Richardson, M.A., M.D.

Senior Physician to the Royal Infirmary for Diseases of the Chest, and Lecturer on Physiology at the Grosvenor-place Medical School.

I. Toxicology.

Poisoning by solanum nigrum.—Two little girls, between three and four years of age, took some considerable quantity of the leaves of the solanum nigrum. Between two and three hours afterwards they were both seized with pain in the bowels, vomiting, great uneasiness, picking at the bedclothes, and delirium. In one, hitherto a healthy child, the pulse and the respiration were quiet on the following day. She had slept, and thereupon her consciousness had gradually returned. The pupils were strongly dilated, but the cure was perfected on this day, after the administration of an aperient enema and the occurrence of a deep sleep. The other child, which had suffered for several days from relaxed bowels, presented the following symptoms. The abdomen was much swollen, the pulse was very frequent and scarcely to be felt; the respiration was quiet; the face pale; the pupils strongly dilated;

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[*] Virchow's Archiv, Band xv. Hefte 1, 11, p. 163.

there was great uneasiness of body, picking at the bedclothes, and entire loss of consciousness. Emetics and aperients led to no useful result, and the child died, with signs of extreme exhaustion, at seven o'clock (in the evening?) of the second day. No autopsy was made.—Clarus in Schmidt's *Jahrbücher*, Band 105, 1860, No. 1; and Dr. Magne in *Gaz. des Hôp.*, No. 112, 1859.

Poisoning by the Expressed Juice of the Digitalis Purpurea.—A woman, twenty-seven years old, took on the 19th of May, 1857, for swelling of the limbs, a large quantity of freshly-expressed juice of digitalis. She was at once attacked with violent sickness, then with menorrhagia; these symptoms lasted until the 22nd of May. Medical assistance was not obtained until the 24th of May, when the physician called in found the patient lying upon her back, extremely exhausted, and in a comatose condition The face was pale, the tongue white, the pulse slow, the epigastrium painful on pressure, singultus frequent, diarrhœa frequent, and the lower extremities œdematous. The patient answered unthinkingly when questions were put to her. On the 27th of May the singultus continued; the intellect was destroyed, and the evacuations were made with difficulty. The patient was said to have aborted on the 20th of May, but absolute proof of this was wanting. On the 31st of May, thirteen days after the poison had been taken, the patient died. At the autopsy, nothing was found abnormal externally, except œdema of the lower extremities, with swelling of the breasts and external parts of generation; milk was discharged from the former, and lochial fluid from the latter. In the peritoneum there was a small quantity of serous fluid; the inner surface of the uterus was covered with a sanguineous fluid; the os was extended and partly open. There were several inflammatory spots on the surface of the stomach; the organs of the chest and head were normal, except that a slight serous infiltration existed beneath the membranes.—Caussé *Bulletin de Thérapeutique*, vol. lvi. p. 101.

Poisoning by the Flowers of Nerium Oleander.—Kurzak has observed a case of a child, two years old, who had eaten two of his own handfuls of the flowers of the nerium oleander. He became after ten minutes uneasy, and vomited. After great improvement and cheerfulness, he became in the course of six hours soporose. His face was pale, and his skin cold and unimpressionable; the pupils contracted, the pulse and the breath were slow and irregular. After sickness he woke up, but again fell into sopor, which changes occurred frequently. After he had taken a quantity of strong black coffee, he came to himself, but remained feeble and sleepy, the pulse intermitting every four or five beats. Next day there was frequent vomiting, with feebleness, sleepiness, dilatation of the pupil, constipation, and intermittence of the pulse every thirteen beats. In the evening he fell into a natural sleep, from which, on the morning of the third day, he awoke quite restored. Orfila places the oleander amongst the class of narcotic poisons. The watery extract is very active as a poison in contact with the stomach; but more active when injected into the veins. The powder of the leaves and of the bark is in a slight degree poisonous. —Maschka in *Vierteljahrschrift*, Band ii. No. 17, 1860.

Poisoning by Corrosive Sublimate.—Vigla has communicated a case in which a man, twenty-seven years of age, took from three to four grammes of corrosive sublimate in water, on the 24th of May, 1859. At once there occurred a strong metallic taste, contraction of the throat, nausea, vomiting, but no severe pains in the body. The vomit at first consisted of the food, then of serous fluid. The patient took an emetic; afterwards milk and white of egg. On the following day there was more intense pain and irritation of the throat, coming on in paroxysms; convulsive cough, expectoration of bloody mucus, and much suffering. Enteritis also developed itself, with violent colic, tenesmus, and frequent slimy and bloody evacuations. On the 26th of May, there was great inflammation of the mucous membrane of the throat and mouth, œdema of the palate and gullet; pseudo-membranous separation from the inflamed parts and salivation; the intelligence was somewhat restored; the pulse was eighty-six. The urine was normal. Up to the 4th of June, all inflammatory symptoms gradually subsided; yet from that time great prostration of the powers of life and mercurial cachexia were presented. On June the 7th, ecchymosis upon the skin and albuminuria, and great irritability of the whole body were present; there was a murmur with the first sound of the heart and singultus. The patient died on the 8th of June without any convulsion or struggle, in a state of extreme exhaustion. The sectio cadaveris record is wanting.—Clarus in Schmidt's *Jahrbücher*, Band cv. No. 1, 1860; and Vigla in *Gaz. des Hôp.*, 112, 1859.

Experiments with Haschish.—Our friend, Dr. Polli, of Milan, has favoured us with a most interesting account of the effects of haschish, derived from his own observations and experiments. We extract from his history the following curious details.

The specimen of haschish used by Dr. Polli was brought from the East by Dr. Rosa. It was in a cylindrical form, and of a dark brown colour; it looked like a dry extract. It had a slight smell; it could be dissolved in water, but much more readily in ether; from the solution a black resinous substance separated itself, having all the characters of cannabina. A gramme of this haschisch contained a quarter of a gramme of resinous matter, and burnt, it left behind half a gramme of ash, in which was evident the presence of oxydes of iron, lime, silica, and carbonic and sulphuric acids. The dose which Dr. Rosa asserts was taken at Damascus was about half a gramme; this would represent about twenty centigrammes of active or resinoid substance: he had only seen this substance made use of in the pipe, but Dr. Polli and his colleagues, to assure themselves of the effect of it, took it internally. These gentlemen took haschish in half-gramme doses, biting it and swallowing it down with sips of rum; half an hour passed without effect; they then took a second dose in the same manner, and drank a cup of coffee upon it; a little later they took a third dose with coffee, and smoked a fourth dose with a little Hungarian tobacco. At the end of their pipes they felt no effect, but soon one of them commenced to jest upon some Frenchified words, and to make quick movements with the spoon used to stir the coffee; in him the first signs of inebriation showed themselves, whilst his companions remained unaffected to external view, but were feeling a little mental aberration. The effect was complete on all about one hour and a half after taking the first dose.

In addition to these facts, evidence is given from Dr. A. Teste, who took the drug ten or twelve times, and gave it to twenty persons. He affirms that haschish provokes appetite before food, and assists digestion if taken with food in small quantities. Dr. Polli confirms this. The following are the effects, described by Teste, of a very large dose. There is first a sensation of "vacuity and at the same time of fulness in the brain, without any anxiety or illness; then a whistling in the ears, which changes to a bubbling; the vault of the cranium seems to be raised, and there follow exacerbations of heat, which rise to the head and colour the face; there is fulness and vivacity of the eyes. Very quickly the sound in the ears ceases; and there is set up sudden laughter. Efforts are made to speak, but what would be said is forgotten; the words and the ideas are perplexed, and a tremendous burst of laughter breaks off the sentence begun; in a few minutes this inordinate laughter becomes irrepressible. After a certain time a sort of soft languor takes possession of the patient, and the powers of movement are impeded, the limbs feel as if separated from the body; all seems to be embellished around; a splendid light appears to inundate, yet with blinding sensation; the most ordinary faces appear seraphic; ideas flow one into the other, and the subject abandons himself with so much rapidity that an age seems to have been lived in a minute. Those faculties of the mind, which in the normal state are most exercised, are those also which are most exercised during the inebriation. There are excited no amorous propensities. Very rarely, however, the haschish may bring on melancholy symptoms or delirium. After some hours the exaltation declines and sleep succeeds; sometimes borborygmi and nausea, or stitch occur; a copious diarrhœa relieves these symptoms. The desire of going to bed becomes irresistible, and sound sleep ends this inebriation, which resembles nothing else in results and effects. It appeared from the further observations by Dr. Polli that while the subject is under the influence of haschish, he does not feel pain from blows, and the mind becomes quite docile, yielding readily to the orders of a companion. One gentleman who very accurately records his sensations, observed that the general anæsthesia into which he was thrown passed from the left half of the body first. Consciousness was never entirely lost. The symptoms did not fairly pass off in this gentleman for thirty-six hours. Another of the experimenters who took a large quantity of water after the haschish, had copious vomiting, which lasted eleven hours.

From some further experiments, Polli determined that haschish possesses powerful antiseptic properties, and he suggested that the substance might be used as an antidote in hydrophobia.

[Since the publication of the paper from which the above is taken, we find from a note courteously sent to us by Dr. Polli that he has tried haschish in a case of hydrophobia, but without success. On the 12th of May of the present year, a young man in the Grand Hospital at Milan, who had been twenty-four hours affected, was treated by Dr. Polli with the drug. He took three grammes of the substance in a short period. The hydrophobic delirium was soon masked by a quiet delirium; the patient at once became good, docile, and confiding; but the dysphagia continued, and after the convulsions a general paralysis succeeded. He died on the third day. At the post-mortem, the blood was found black and fluid in all the vessels, and evolved ammonia. It did not coagulate spontaneously, but did so on addition of a feeble solution of sulphuric acid. The blood that was left alkaline remained free from putrefaction for two months.—B. W. R.]

Poisoning by Cyanide of Potassium.—A man engaged in photography, age thirty-six, took a draught prepared by himself on the 18th of December, 1858. After taking the fluid, he suddenly died. At the post-mortem, the external surface of the body was blanched; the death ecchymoses were well marked; the blood everywhere in the body was dark and fluid; the brain and lungs were hyperæmic. The mucous membrane of the stomach and intestines exhibited throughout no unusual appearance (*keinen regelwidrigen Zustand*). There were submitted for analysis one white medicine-glass, containing a colourless fluid, and two other glass vessels containing the intestines. The fluid No. 1 showed evidence of potassa and of hydrocyanic acid. The contents of the stomach consisted of a grey, dark-coloured fluid of a tolerably strong acid reaction; it had not in the least the smell of bitter-almonds, but a disagreeable odour of putrefaction. The fluid parts strained off the solid parts were found to consist of half-digested food. The fluid part was searched for cyanide of potassium. It was distilled after addition of sulphuric acid. The fluid contained hydrocyanic acid, which was separated by the distillation; together with this acid, which was only in small quantities, there was also formic acid and fat acids.—*Maschka, in Vierteljahrschrift*, Band ii., No. xvii., 1860.

Poisoning by Phosphorus.—Dr. Tüfferd, Jun., records three instances of poisoning by phosphorus. Two cases were in children three years old, and one in an adult. All rendered symptoms of gastro enteritis, burning pain in the bowels, vomiting, and diarrhœa. The symptoms were most acute in the children, and death ensued after a few hours. The symptoms in the adult assumed a more chronic form, and death did not take place for three days. As has been observed in other cases, there was presented in the adult a temporary decrease of all the symptoms of gastro enteritis, with sudden renewal and a fatal result on the third day, following upon a meal which had been eaten with relish. The vomit gave in all cases the peculiar phosphorous odour. Inflammatory softening of the stomach was found after death; it was exceedingly intense in the children, whilst in the adult the inflammation scarcely exceeded the limits of marked hyperæmia. In all cases the bladder, notwithstanding the quantity of fluids taken, was empty.—Tüfferd in *Journ. de Chim. Méd., Août,* 1859; Clarus in *Schmidt's Jahrb.*, Band civ., 1859. No. 12.

Poisoning by Strychnia.—The following case, reported by Dr. Paley, of Peterborough, we give at more than usual length, owing to the precision with which the narration of the symptoms and pathology is given.

"I was sent for" (Dr. Paley reports) "on Sunday, the 6th of May, about half-past two o'clock in the afternoon, to see Mary Jane Pope. Her father, who came for me, gave me the following information. His youngest child, an infant about five months old, had died in convulsions a few weeks previously. Another boy, aged eight years, had quite recently been suffering from fits; he was drawn backwards, and became stiff, but had eventually recovered, after a fit of vomiting. His daughter, whom he now wished me to see, had been seized with a fit whilst at chapel that morning. My attention was thus directed, even before I saw the patient, to the very singular fact that three children of the same family had all been suffering from fits within so short a period. I ascertained subsequently that my patient, who was a well-made, very healthy-looking girl, between seventeen and eighteen years of age, who had scarcely ever before suffered from any illness, had appeared in her usual health that morning; that at about half-past nine o'clock she had made a hearty breakfast, with the rest of the family, of coffee, bread and lard, and cold mutton; that she then dressed herself, and went to chapel about eleven. After being there about three quarters of an hour, she was observed suddenly to throw herself violently back in her seat, and then fall forwards, her hands twitching about. She was assisted out of chapel by two neighbours, and was enabled to walk home with their help, a distance of two hundred and fifty yards. She appeared in pain, walked unsteadily, had frequent twitchings, especially of the right side, but was quite conscious.

"She was put into a warm bath by her friends, and while in it was first seen by my friend Mr. Pearce, a little after one o'clock. In his evidence before the jury, he states:—'I found her quite able to answer questions. Said she was in no pain, and did not feel sick: the pulse was very quick, and the pupils natural.' Mr. Pearce sent her five grains of calomel, and five of scammony, and a draught with some salts and senna, which were administered as soon as they arrived. On his return to the house, in about half an hour, he found her in bed, just recovering from a second fit. He stayed with her, and in about twenty minutes she had a third fit, which lasted about three minutes, and which he thus describes:—'It commenced with convulsions over the whole body and limbs; the limbs were particularly rigid; her head and body thrown backwards; she requested to be held tight, complained of great constriction about the throat, and said she felt as though she was choking. The convulsions were succeeded by blackness of the face; at the same time the system became generally relaxed; this was followed by great paleness of the lips and countenance. There was slight frothing at the mouth.' When the fit was over, Mr. Pearce observed: 'She could swallow without difficulty. If I coughed loudly, it brought on spasm; if I came suddenly into contact with the bed, or if I lightly touched her on the foot with my finger, it brought on spasm.'

"It was after this third fit that I arrived. I found her in bed, wrapped in blankets, perspiring profusely, as if just out of a hot bath. Her countenance was anxious; the pulse so quick that I could scarcely count it; the eyes were turned up; the pupils natural. She was perfectly conscious, answered questions readily, and said she was in no pain. On speaking to her rather loudly, I observed a slight convulsive trembling of all the limbs to come on; the same thing occurred on touching her wrist to feel her pulse. Her nervous excitability was so great, and she complained so much of our disturbing her by speaking before her, that Mr. Pearce, her mother, and myself, withdrew into the next room to talk over the case. In about ten minutes we were called again into her room, as another fit—the fourth—was coming on. I found her quite sensible, with convulsive twitchings of nearly all the muscles of the body, slight at first, but rapidly increasing in intensity, till she shook the bed under her. She called out, 'Hold me! hold me!' and appeared excessively alarmed. I put my hands on both her knees, to steady them; they were not then rigid, but were twitching convulsively; there was then no distortion of the face. In a very short space of time—I should think after the lapse of about a minute—tetanic rigidity of apparently every muscle of the body came on. In consequence, respiration was entirely suspended; the face turned first livid, and then deadly pale; the pulse ceased to beat; slight foam came from the lips; and she appeared dead—in fact, I thought she was dead. In about half or a quarter of a minute, however, the tetanic spasms relaxed; the eyelids began to quiver; she began gradually to breathe again, and in a few minutes appeared almost as well as before the fit. The only time she was insensible was during the very brief period that the tetanic spasms lasted."

On seeing this paroxysm, Dr. Paley at once suspected that the case was one of strychnine poisoning, in which opinion he was joined by Mr. Pearce. Inquiries made of the parents, however, elicited that they knew of no administration of poison—that, in fact, they had no poison in the house, to their knowledge, and did not know that anything had been taken at all by the patient for four hours. Dr. Paley's history thus continues:

"As so long a time had elapsed since the poison had been taken—probably nearly four hours—supposing that not more than twenty minutes or half an hour at most could have passed between the swallowing of it and the production of its effects, there appeared to us to be little use in then giving emetics, as a large portion of it must by that time have been absorbed into the system. We contented ourselves, therefore, with keeping her as quiet as possible, with only one attendant and myself in the room. We gave her a little aromatic spirits of ammonia and camphor mixture, as she appeared very faint, part of which she swallowed easily; but on giving the rest, a few drops fell from the spoon on her bare neck, and immediately brought on the spasms, so we desisted. She remained tolerably quiet for the next twenty minutes; but we noticed that when touched or sharply spoken to, the spasmodic tremblings of the limbs immediately came on. I now left her for about twenty minutes in Mr. Pearce's charge, and on my return found that she had had another fit—the fifth—exactly similar to the one we had witnessed together.

"We then thought it would be right, as a last resort, to try an emetic, and gave her a scruple of sulphate of zinc dissolved in about half a teacupful of warm water, which she drank readily. Mr. Pearce now left to visit other patients, and I remained. In about fifteen to twenty minutes the sixth and last fit came on. It presented precisely the same symptoms as the one I have previously described, save that towards the close of it the general tetanic rigidity of all the muscles was more severe; the face became of a deep purple;

she gasped out 'Choke, choke;' foam came from her lips, and she ceased to breathe. It was impossible to say precisely when she died, as the tetanic rigidity did not relax at all, as in the former fit, but remained long after death. The arms were forcibly bent over the chest, crossing each other, and the hands were rigidly closed. I felt the legs, and found them perfectly stiff, so that I could not bend the knees. The stiffness of the limbs continued as long as I remained with the body—about fifteen or twenty minutes—but in about half an hour afterwards, the nurse was able to forcibly draw down the arms by her side. I should have mentioned before that she frequently complained of thirst, and drank several times a glass of water. During the whole time of her illness, there was no evacuation either from bladder, bowels, or stomach.

"*Examination of the body*, twenty-three hours after death, by Mr. Pearce and myself.—The weather being cool, decomposition had only just commenced. The body was well formed—rather fat. The front of the legs, the feet, and many other parts of the body, were much discoloured; the features were greatly swollen, and a quantity of dark coloured frothy mucus was running from the mouth and nose. There was no unusual rigidity about the limbs. We opened the body, tied carefully the two ends of the stomach, and removed it with its contents. On slitting it open, we found about two ounces and a half of half-digested food, with fragments of meat distinctly visible, all which, with the stomach itself, we carefully preserved. At the cardiac orifice, there was a small patch of membrane where the bloodvessels had an injected and arborescent appearance; close to the pylorus there was another patch of about the size of a dollar, of a very dark, almost black colour, and near it several spots of distinct ecchymosis; the membrane, though softened, was not abraded. We then removed the intestines, and slit them up through their whole extent, reserving their contents. At the end of the ilium there were several similar spots of ecchymosis, but, with this exception, they were perfectly healthy. The liver, a portion of which we preserved, was very dark coloured and soft, but otherwise natural in size and structure. The spleen was also natural, but rather congested. The kidneys were dark, as if gorged with blood; but, on cutting them open, no appearance of disease in their structure was seen. The uterus was of natural size, unimpregnated. The bladder contained a considerable quantity of urine, some of which we preserved. In the chest, we found some old adhesions at the base and posterior part of the right lung. The lungs themselves were much congested, and of a very dark colour, but crepitant throughout, and otherwise healthy in structure when cut into. On cutting through the large vessels at the neck to take out the lungs, we were struck with the unusually large quantity of dark fluid blood which flowed from the venæ innominatæ; some of this we preserved. The pericardium was quite healthy. The heart, of its natural size and structure, was nearly empty of blood; what remained was quite fluid; there were no coagula in its cavities; the valves were quite healthy. We then opened the head, and took out the brain carefully; both it and its membranes were remarkably healthy, and on slicing it, no trace of disease could be detected in its structure. We then opened the spinal canal, and took out the upper three-fourths of the cord and its membrane; both were perfectly healthy. With the exception of the slight traces of inflammation in the membranes of the stomach and ilium, and the generally congested state of the thoracic and abdominal organs, the whole body appeared to be free from disease."

The chemical analysis was conducted by Dr. Letheby. The results of this investigation were, that the stomach contained strychnia, a preparation of zinc, and mercury. The same treatment was applied to the contents of the intestines, and strychnia was also found in very small quantity. The liver also yielded it in small proportion, as well as a trace of mercury. The blood was examined in the same way, but with negative results; for not only was the ethereal residue free from bitter taste, but it had no action on a frog, although that animal is affected by the 0·0005 or the $\frac{1}{2000}$th of a grain of strychnia. The urine amounted to twenty-two fluid drachms. It had a very pale amber colour, was slightly acid to litmus-paper, and had a specific gravity of 1014. When it was boiled, it became very turbid from the presence of albumen. It was precipitated with subacetate of lead, filtered, and the excess of lead removed by sulphuretted hydrogen. After the separation of the sulphide of lead, the clear solution was evaporated nearly to dryness. It was then treated with ether; and the ethereal solution gave a bitter residue, which in very small quantity convulsed a frog. The residue was acted on with a few drops of concentrated sulphuric acid, in order to destroy impurities. The strychnia which was then obtained was nearly pure. It weighed 0·3 grain, and gave, with sulphuric acid and peroxide of manganese, as well as with the galvanic test, the brilliant reactions of strychnia. Three frogs were convulsed with it in less than five minutes, and were dead in from ten minutes to a quarter of an hour. These results are highly satisfactory, for they furnished undoubted evidence of the absorption of strychnia during life, and the secretion of the poison unchanged with the urine. Lastly, a packet of powder, marked "Battle's vermin-killer," consisted of flour, a little sugar, strychnia, and Prussian blue. Ten grains of the powder furnished to ether 2·3 grains of strychnia—a quantity that represents 23 per cent. of the poison.—*British Medical Journal,* August 4th, 1860.

Chloroform as an Antidote to Strychnia.—Dr. J. R. Smith records the annexed details. In November, 1857, a young man of the name of Reardon was supposed to have been frozen. Dr. Smith, on being called, discovered symptoms of poisoning by strychnia. The muscles were powerfully contracted, the limbs stiffened, the jaw locked, respiration difficult, and the pulse small and frequent. The severity of the symptoms induced him to think it impossible the man could recover. The first remedy which suggested itself as the best was chloroform, and he administered it by inhalation sufficiently to relax the muscles to admit of easy flexion of the legs and arms; respiration then became quite natural, the pulse less frequent and more perceptible. The chloroform was then withdrawn till the tetanic symptoms returned, and again applied and alternately withheld till the effects of the strychnia passed away, which was about ten hours. Dr. Smith first saw the patient at nine o'clock in the evening. At seven the next morning consciousness returned, and the chloroform was then withheld. An emetic was given, afterwards a purgative, and the man became gradually convalescent, his appetite and strength returning, till two days afterwards, when symptoms of strychnine poisoning again appeared, but were not alarming. After this, recovery was very rapid. This man is now a soldier in the Canadian 100th regiment. Twenty-four ounces of chloroform were used, though no doubt much was lost on the sponge; the chloroform was used in such doses as to produce a slight relaxation of the inferior maxillary, and easy flexion of the upper and lower extremities. It appears from the statement of the man himself that he was a hunter, and used strychnia in destroying wolves and foxes, and in a temporary fit of madness from the use of spirits took a dose of the poison himself in a glass of liquor. A small vial containing strychnia was found on his person.—*American Journal of the Medical Sciences,* July, 1860.

Caffeine as an Antidote to Opium.—Dr. H. F. Campbell reports that on July 10th of the present year he was called to visit a gentleman said to have been found in a dying condition in one of the rooms of an hotel. The patient, Mr. Moses Pike, a Jew, aged about twenty-eight years, was of good constitution apparently, and well developed corporeally. On entering the room, Dr. Campbell found him in the following condition:—He was entirely unconscious; face of a dark purple hue; hands and feet also purple from congestion; nails on fingers and toes of an indigo colour. There were also patches of venous congestion, presenting a darkened hue all over the surface. His respiration was fearfully slow when counted, not quite four to the minute. The attendants were slapping and shaking him each time between the inspirations, to excite him to breathe. His respiration seemed greatly obstructed by the accumulation of mucus. Pulse very feeble, and about 100 per minute. The muscular system was completely relaxed, so that his head would fall about by its own weight, and his arms and legs obeyed only the influence of gravity. Immediately on our arrival, a paper was found, on which the unfortunate man had recorded the fact that he had taken laudanum at twelve o'clock the night previous, with the intention of self-destruction. Two empty phials, labelled laudanum, one of two ounce capacity, the other of one ounce, were found on the table. One of these phials had the neck knocked off, apparently with the view of opening it hastily—and some of the laudanum had escaped so as to leave a stain upon the label. It is probable, therefore, that the entire three ounces had not been taken. Once or twice during the morning, the servant stated, that he had approached and tried the door, with the view of entering, but had desisted when he heard the occupant snoring deeply, as he did not wish to disturb him. Somewhat after three o'clock P.M., the servant became alarmed and looked into the room through the transom-light from a chair, and observing his condition, called for assistance. From the above circumstances, as well as from the written statement of the patient, it was highly probable that near three ounces of laudanum had been in his system nearly fifteen hours—that so large an amount had not produced death in so long a time, is truly unaccountable.

The condition of the patient, the necessity of constantly provoking respiration, and also the little probability that any laudanum yet remained in the stomach, caused Dr. C. to abandon the idea of using the stomach-pump. Emetics were out of the question, and he at once resorted to the application of ice to the scalp, and pouring ice-water, from a distance, upon the head, while he sent for a drachm of caffeine, and a small syringe. As soon as these arrived, he poured out in the palm of the hand what was supposed to be about twenty grains of caffeine, dissolved it in two ounces of cold water, and introduced it into the rectum by means of the syringe. The syringe being small, three applications were made at short intervals. The whole of the alkaloid was not dissolved. By an estimate made subsequently, calculating what had been lost, the patient had taken near *twenty-five grains of caffeine* in the three applications. The caffeine was administered at twenty minutes before four o'clock, at which time, as it has been said, the respiration of the patient was *scarcely four to the minute*, and constant efforts were necessary, in the way of slapping and shaking, to provoke him to inspire. At fifteen minutes after four (thirty-five minutes after the injection) his respiration was found to be effected with less effort and more regularly; and, on counting it by the watch, it numbered eight to the minute. The skin, even now, began to present less of the cerulean tint. In one hour after, the respiration had risen to twelve, and shortly rose to sixteen to the minute, when the skin was nearly of the natural hue, though the nails on both hands and feet remained still of a purplish cast. Slight spasmodic movements in the fingers were now observed, and also some occasional subsultus in the muscles of the forearm; the under lip, which before was hanging, now became elevated and slightly compressed against the teeth. When the hand of the patient was held, and an attempt made to extend the arm at the elbow, decided muscular resistance was observed. The lid of the left eye was also observed to be raised and let down rapidly once or twice. The pulse had now become full and somewhat resisting, and the action of the heart, as observed at the chest, tumultuous. On being raised, the patient once made a noise slightly resembling a groan, but from the beginning to the end he did not once manifest the least consciousness. For a short time after the improvement in the respiration began, the mucous râle seemed somewhat to diminish, and his breathing, were it not for a certain jerking, resembled very nearly a man in deep, healthy sleep. The râle now, however (half-past seven o'clock), became more and more obstructive, the gurgling reaching up into the throat, threatening momentarily to strangle the patient. It was now plain that he could not survive, and on turning him upon the right side, a bloody mucus bubbled out of the nostrils. The number of the respirations was at this time twenty to the minute when counted by the watch. The entire surface of the body was intensely hot, and remained so to the time of the patient's death, which took place at fifteen minutes before nine P.M. He seemed to die from the accumulation of the bloody mucus in the bronchial tubes and larynx. During the whole time, from the first moment till the time of his death, the application of ice was made constantly to the head of the patient, and mustard plasters were also applied to the spine and to the extremities.—*Southern Medical and Surgical Journal, U.S.*, and *Dublin Medical Press*, Aug. 15th, 1860.

[In the 'American Journal of the Medical Sciences' for July, 1860, pp. 282-3, there will be found another case treated in the same way by Dr. Campbell, and with success.]

Death following inhalation of Chloroform.—On the morning of August 1st, 1860, Dr. A. Rives, jun., was requested by Dr. Mason, acting house-surgeon of the first surgical division, to administer chloroform to Michael Laneham, preparatory to the operation of circumcision. Patient was forty years of age, and complained of nothing but a chancre under the prepuce. Dr. Rives proceeded to administer the chloroform on a napkin, pouring out small quantities at a time, and allowing a space of from one-half to one inch to intervene between the patient's mouth and the napkin, so that there might be a free admixture of atmospheric air with the anæsthetic agent. He, at first, observed nothing unusual in the behaviour of the patient; his respiration was natural, his pulse good, and he soon exhibited the usual symptoms of muscular action which precede anæsthesia. The whole amount of chloroform thus far employed could not have exceeded an ounce and a half, and a large portion of this must have been lost by evaporation. After administering the chloroform for four or five minutes, Dr. Rives was startled by a sudden stertorous expiration, and immediately removed the napkin entirely. This was the first intimation he had of the patient being so nearly fully anæsthetized. For nearly a minute the patient continued to make stertorous expirations, followed by regular inspirations, and Dr. Rives regarded these phenomena as nothing more than signs of the full anæsthetic influence; in a moment, however, after a long stertorous expiration, the patient did not inspire. Immediately, the thorax was alternately compressed and allowed to dilate by the resiliency of its walls; in this way the patient continued to respire for a short time—occasionally missing one or two inspirations, and afterwards taking a long one; occasionally, also, he would take a deep inspiration unassisted by artificial respiration, though his pulse could not at this time be felt at the wrist. Brandy and a solution of carbonate of ammonia were administered both by the mouth and by injection; but finally, after a stertorous expiration, he ceased to breathe entirely. Dr. Mason auscultated his heart, but no sounds could be heard. He was rolled on his side and then back again, on the plan of Marshall Hall, and the galvanic battery was employed to the chest and the nape of the neck, occasionally putting the two poles over the origin and insertion of the thoracic muscles. A tube was passed into the trachea by Dr. Peuguet, and the lungs were inflated with the bellows; meantime the extremities were rubbed by assistants, and artificial respiration kept up. A tenaculum was inserted into the tongue, by which means it was drawn forwards and held in this position, so that the air might have free access to the lungs. At the expiration of an hour and ten minutes, the extremities had become quite cold, the pupils were widely dilated, the eyes fixed; the pulse had not been felt at the wrist for more than an hour, nor had the heart sounds been heard, and though the air could be heard rushing in and out of the throat, it was evident that this was only mechanical. With the concurrence of one of the visiting physicians present, all efforts to revive him were discontinued.

The post-mortem examination took place twenty-eight hours after death. The weather was warm, rigor mortis moderate, better marked in the lower than in the upper extremities; the body well nourished; post-mortem congestion was seen upon the posterior part of the trunk and upon the head and side of the face; chancre on the glans penis; prepuce œdematous; abdomen tympanitic; dark blood was escaping from the nose, and some frothy mucus from the mouth. The calvarium being removed, the dura mater was found normal; there was subarachnoid effusion, enough to fill the sulci of the brain; on both hemispheres small patches of old lymph; the superficial cerebral vessels were congested, and a small amount of bloody serum was present in the lateral ventricles; the brain otherwise was healthy. The lungs collapsed; each pleural cavity contained about eight ounces of serum stained with blood; about two ounces of serum was in the pericardium, otherwise both the pleura and pericardium were healthy; the heart was *soft* and *flabby*, and upon microscopical examination, was found to have undergone *fatty degeneration;* it weighed ten ounces. The muscular tissue of the right side appeared of the natural colour; auricle and ventricle were opened, but contained no clot; the valves were healthy, and the muscular tissue of the left side also appeared of the natural colour; the auricle and ventricle of this side were also opened, but contained no blood clot. The valves were healthy and of a bright colour, with one or two patches of atheroma upon the mitral valves. Both lungs were found congested throughout, particularly the posterior portion; in the upper and lower lobes of the right lung were some apoplectic clots, and the lower lobe of the left lung also contained an apoplectic clot as large as a filbert; both lungs were œdematous and less crepitant than usual. There was a small amount of bloody serum in the cavity of the abdomen; the kidneys were large, weighing about eight ounces each, both apparently healthy, though the capsules were more adherent than usual; and both organs were somewhat congested. The spleen was as large again as usual, but natural as regards consistency. The liver was healthy, about five pounds in weight and somewhat congested. The stomach presented a patch of congestion near the cardiac extremity, close to the œsophageal opening. There was also another patch of congestion near the pyloric orifice. The intestines were inflated with gas, but otherwise healthy; the bladder was firmly contracted.—Dr. Alex. Rives, Jun., in *The American Medical Times*, August, 1860.

II.—OBSTETRIC JURISPRUDENCE.

On the Lineæ Albicantes in Puerperal Women.—Dr. Credé was induced to give the following results of his observations on this subject, in consequence of the (as he considered it) too indiscriminate statement made by Caspar, in his Handbook of Juridical Medicine. Dr. Credé states that the line albicantes are formed in very different degrees in the majority of pregnant women, but are very seldom observed during the first half of pregnancy, and often only during the last or the penultimate month. During his management of the obstetrical department of the Berlin Charité, and at the Leipsig Obstetrical School, he paid particular attention to the matter, and the general result was that these white cicatrix-like lines were observed in 90 per cent. of the cases examined; and they have very rarely ever been met with during the first half of pregnancy. They are generally disposed with some regularity, radiating from a mesial point that is placed about one or two inches below the umbilicus. With the expansion of the abdomen, the lines often become more irregular and unequal on the two sides.

After delivery they put on another appearance, but do not entirely disappear. The freshly-produced streaks, especially in primiparæ, are of a shining, bright reddish appearance in women having fair or red hair, and brownish in those whose hair is darker. The redness is lost sometimes only a few days after delivery, leaving a dirty white appearance, accompanied by wrinkling of the skin. On the occurrence of a new pregnancy, however, or when the abdomen becomes distended from any cause, the streaks exhibit a shining whiteness, with here and there a brownish tinge.

In several instances no traces of these appearances are discernible, even after repeated pregnancies, and the result of Dr. Credé's most careful examination went to show that these lines were absent in 10 per cent. of the cases he examined expressly to ascertain the fact; of these cases, 7½ per cent. were primiparæ, and 2½ per cent. multiparæ.

These streaks are sometimes formed only during the second or third pregnancy, or new ones may become added to those already existing. This may be owing to the greater distension the abdomen has undergone in subsequent pregnancies. In general, it will be found that the woman in her first pregnancy was not strong, and had not carried her child to its full time. It is at all events common for a woman who has gone through a normal pregnancy, without these lines appearing, to have them manifest themselves on subsequent occasions; on the other hand, it is not uncommon for those who have aborted at the fifth or sixth month, to first exhibit them at the end of a subsequent pregnancy. That these marks, when once formed, ever disappear, Dr. Credé does not admit, and consequently denies the correctness of the statement that they are met with more abundantly in primiparæ than in multiparæ. They are only more plainly seen on account of their brighter colour.

The lines may also appear as a consequence of various diseases which give rise to great and sudden distension of the walls of the abdomen; and this not only in aged women, but also in young persons who may very well become the subjects of juridical investigation.

Lines of exactly a similar appearance which occur on the breasts, thighs, buttocks, or calves of the legs, equally deserve consideration with those observed upon the walls of the abdomen. Montgomery has especially dwelt upon the importance of the sign derived from the coincidence of the lines on the breasts and abdomen. Dr. Credé's observations have convinced him that their presence is of much seldomer occurrence on the breast and other parts named than on the abdomen.—*Monatschrift für Geburtskunde*, Band xiv. 1859.

III. INSANITY.

On Homicidal Mania without disorder of the Intellect.—On this subject Dr. C. Lockhart Robertson publishes a most important paper, based on the history of a case admitted under his care into the Sussex Lunatic Asylum on November 14th, 1859. The patient bore with him a report from Dr. Huxley of the County Asylum at Maidstone, under whom he had previously been placed. "Scarcely anybody," wrote Dr. Huxley, "who has been concerned with G. T. but has suffered more or less." One point deserves particular mention; the man never attacked with his fists in the fair English fashion, he always resorted to a weapon, such as could be used stiletto-wise. The man appeared to be an assassin by nature. Another feature was his treachery. He could calculate well his time of attack, so as to have his intended victim at a disadvantage. He was admitted into the Kent Asylum on August 31st, 1855. He had been a chemist's assistant; aged twenty-five, and single. He said he was a prophet and inspired, and obliged to obey commands from above. He heard voices in the night which he was obliged to obey. A loaded revolver was found upon his person, and he said it was necessary from the condition of society. He was removed from the Kent Asylum on October 31st, but was re-admitted from Maidstone Jail on December 31st, 1856, after which he gave continual exhibitions of his homicidal tendency. When he was admitted to the Sussex Asylum he was calm, collected, and repentant of his misconduct; the man, during his stay at the Sussex Asylum, "had exhibited no sign of mental disease," and so far gained on all, that Dr. Robertson invited him to become chapel clerk. In January, 1860, Dr. Robertson reported to the commissioners this condition of the man, and his opinions leant to his ultimate discharge. The memorandum was written on the 6th of January. On the 18th the patient, who had continued to conduct himself with perfect sanity, was present at one of the weekly balls. He complained to Dr. Robertson of not feeling very well, and his tongue was white; he complained of faintness, and Dr. Robertson took him into the assistant medical officer's room, and gave him a glass of whisky and water, and he laid down on the rug. In a quarter of an hour he was better, and went to bed. There were knives in the room, and he could, had he been disposed, have injured either Dr. Robertson or the assistant medical officer, Mr. Gwynne. Next morning, while Mr. Gwynne was on his rounds in the airing court, the patient came up and shook hands with him as usual, and said he wanted to speak to him about some money matters of his own; he then suddenly, and without the slightest provocation, attempted, with a sharp piece of wood he had concealed about him, to destroy Mr. Gwynne's eye. The blow glanced off, but Mr. Gwynne fell. The patient then closed with him and attempted to kick and injure him, but was soon overpowered. After a short time, by an order from the Secretary of State, "G. T." was removed to the Fisherton House Asylum. From the time of his attempt until the date of his removal, he was constantly seeking for an opportunity to renew his attacks. His countenance assumed a fierce expression, and his eye lighted up with the glare of a wild beast, when he was visited or spoken to by Mr. Gwynne or Dr. Robertson. In May Dr. Finch, of the Fisherton House Asylum, reported to Dr. Robertson that "G. T.," while in his new security, had made two attempts to stab the attendants, in the second instance again aiming at the eye his blow.

Dr. Robertson, in a judicious commentary on this case and two others, to which he refers, divides homicidal mania into three varieties:—

1. Homicidal mania without disorder of the intellect, as in the case of "G. T."
2. Homicidal mania with delusions bearing directly on the act. Auditory delusions are a frequent variety of this form.
3. Homicidal mania with epilepsy, with weakness generally of the mental powers, with confirmed chronic mania. — *The Journal of Mental Science,* July, 1860.

IV. MISCELLANEA.

Medico-Legal Autopsies in cases of Natural Death, and the causes which gave rise to the misapprehensions.—Professor Toulmouche, under this title, writes an admirable essay. He arranges the diseases, which ending fatally from natural causes may be mistaken by the ignorant and suspicious for death by unfair means, under the following heads.—Deaths from cerebral hæmorrhage, pneumonia, and pulmonary apoplexy. Amongst rarer cases which he has had occasion to observe, he names one of hæmoptysis, one of croup, one of gangrenous abscess of the neck, bursting into the pleural cavity, one of typhoid fever, and one of phlebitis. To these cases the following may be added, as affording possibility of medico-legal investigation—aneurism opening into the larynx or trachea, œdematous angina, spasm of the glottis in infants, and malignant carbuncle. Passing into the details of cases, Professor Toulmouche relates one in which a child was supposed to have been maltreated by its parents, and to have died from external violence; the death proved to have arisen from croup with lobular pneumonia complicated by the presence of lumbrici in the intestines. In a second case, a man who was supposed to have met with death by violence, was found to have died from an abscess which had formed under the chin, and which had opened a path into the right cavity of the thorax; there was no mark of external violence. In five cases the Professor records that he has had to make judicial inquiries into the cause of deaths which have been traced to pneumonia; in two of these cases the pneumonia was single, and in three double. In another case, where some wounds existed or appeared to exist on the surface of the body, the death was found to have been occasioned by pulmonary apoplexy. In a sixth curious example, where a child was supposed to have been destroyed by its parents, the death had taken place by hæmorrhage from the lung. In another instance the suspicion of murder was removed by the observing of evidences of typhoid fever; and in a last case where, once more, death was supposed to have been by violence, the post-mortem proved that the patient had succumbed to a phlebitis, caused probably by the use of a rusty or broken instrument by which a vein had been opened, the patient having also imprudently used the arm a little time after the operation.—*Annales d'Hygiène Publique*, Juillet, 1860.

Death from Lightning.—Mr. Nuttall, assistant surgeon, 18th Regiment Bombay Native Infantry, reports that on the 17th of March, 1858, he was sent for during a thunder-storm, to the Hospital of the 18th Regiment Native Infantry, shortly after four P.M., and was there shown the body of a native, with a peculiar smell of fire about it. The body was that of a man in the prime of life, and its only clothing was a "dhotur," with which the lower part of the trunk was girt. There was no distortion of the features, with the exception of a very slight frown; the eyes were closed, the pupils dilated, and the lips open, the limbs were flaccid, and the body was cold, though not more than a quarter of an hour had elapsed since death. There were traces of an emission, apparently seminal, the hair of the back of the head, on the left side, was singed; the cuticle on the left side of the back of trunk, from the top of the shoulder to the buttock, was stripped off, and so also was the integument on the back of the calf of the right leg—the exposed cutis having here and there a scorched appearance. The hair on the inside of both legs was singed, and a very small hole was burnt in the "dhotur," where it covered the nates on the left side, the electric fluid having seemingly passed between it and the skin. No post-mortem examination could be obtained. This man was standing (naked all except his "dhotur") beside a post that supported the roof of his hut, and which post rose higher than any of its neighbours. The bolt entered in the immediate neighbourhood of this post, forcing a hole through the roof, and making its way into the ground at the foot of its victim; at least the earth there bore traces of having been very recently disturbed in a strange manner. Two other men who were with the deceased in the hut were knocked down at the same time, and stunned; all they knew about the matter being that a dazzling light suddenly shone round about them, accompanied by a loud report, and followed by their own insensibility, which could not, in either case, have lasted above two or three minutes. On coming to themselves, they found their comrade lying near them, dead.—*Transactions of the Medical and Physical Society of Bombay*, 1859.

QUARTERLY REPORT ON PATHOLOGY AND MEDICINE.

By EDWARD H. SIEVEKING, M.D.
Fellow of the Royal College of Physicians, Physician to, and Lecturer on Materia Medica at, St. Mary's Hospital.

I. *Notice of a Form of Paralysis of the Lower Extremities.* By JAMES IRVING, M.D. ('Indian Annals,' No. xii., 1860.)

IN October, 1856, it was noticed by Mr. Court that there were a very large number of lame persons in the villages on the right bank of the Jumna, in Pergunnah Barra. The disease was said to be of recent origin, and was attributed to various causes, but especially to the use of bread containing the lathyrus sativus, combined with the influence of bad water. In 1857, Dr. Irving collected about fifty men suffering from greater or less lameness of both legs. They stated that they had all become paralytic during the rains, in most cases suddenly so, and in many during the night; "men who had gone to bed quite well, had awoke in the morning feeling their legs stiff and their loins weak, and from that day they have never regained the use of their limbs. At first the lameness was trifling, and amounted only to unsteadiness of gait, and slight stiffness chiefly of the knees. After a time the muscles of the thighs commenced to ache and feel weak, and also the loins." There was no evidence of fever, nor was the spleen enlarged except in one single case. Many of the patients looked well, and even their legs did not appear to be much wasted, if at all. The arms were never affected, but some were so much crippled as to be unable to walk; the male sex was more liable than females, and Ryots were more liable than Zemindars. In Pergunnah Barra, 2028 persons were in January, 1857, known to be affected with paralysis, or in the proportion of 3·19 per cent. of the population; further, it was found that in Barra there were 295 villages, in 188 of which there were paralytics; of the remaining 107 villages there were 58 uninhabited, so that there were only 49 inhabited villages free from this species of paralysis. Different villages were affected in varying degrees; thus, in Kuchra, with a population of 371, there was only one paralytic, in Soondurpore, with a population of 250, there were 39.

The district where this paralytic affection prevails is described as a vast swamp; the soil of Barra is a stiff marl, with so strong a saline impregnation as to cause an efflorescence on the surface; the water of one well was found by the chemical examiner to Government to contain a large amount of sulphates, carbonates, and chlorides of lime, magnesia, and soda. The people are very poor, and use largely in their bread the kessaree dâl, or lathyrus sativus; it is commonly sown with wheat or barley, and its being very cheap is the reason of its employment, in spite of its being regarded as the cause of the paralytic affection. Dr. Irving quotes other authors in proof of the poisonous qualities of the lathyrus sativus; other species of the same genus are said to have poisonous properties. The author does not appear to have had much opportunity of testing various modes of treatment for any length of time, but he states that tonics and generous diet, with the application of occasional blisters, were serviceable.

II. *On Necrosis of the Cartilage of the Septum Narium.* By HENRI ROGER, Physician to the Children's Hospital, &c. (L'Union Médicale, No. 30, 1860.)

The author, in this paper, contributes two very rare, if not unique, cases of necrosis of the cartilages of the nose, supervening during the persistence of a general febrile affection, and terminating in perforation of the septum. The first occurred towards the termination of rheumatic fever; the second during the convalescence from typhoid fever.

The first case occurred in a young man, aged eighteen, who, after four previous attacks of rheumatic fever, complicated with endocarditis and pleurisy, was seized a fifth time, and after about six weeks' illness, exhibited to Dr. Roger a piece of cartilage of the size of a grain of rice, which he had removed from the septum narium. A complete perforation had been established, the only inconvenience resulting from which was a slightly nasal tone of voice. Death ensued two months later from the disease of the heart. No scrofulous or syphilitic diathesis was discoverable in this patient, and the author suggests the lesion may be due to the rheumatic affection alone, though he does not positively affirm it.

The second case occurred in a young man of nineteen years, labouring under typhoid fever. When Dr. Roger saw him in consultation, he had been ill for five weeks. He observed a slight nasal twang in his voice, and it proved that a short time previously the patient had noticed a perforation in his septum narium, which allowed two fingers introduced on separate sides to meet; the orifice was about the size of sixpence. The nasal tone subsequently diminished.

The author regards this case as analogous to what Rokitansky terms secondary laryngo-typhus, and quotes Sestier, who has brought together twelve cases of necrosis of the larynx occurring in the sequel of typhoid fever. Sestier has not, however, noticed the occurrence of the lesion of the septum narium described above. It appears that the whole nose is sometimes found to become gangrenous in typhoid fever, and Mauthner is referred to as having frequently noticed a gangrenous affection of the nose during a typhus epidemic in Gallicia.

III. *On Glycosuria as an accompaniment of Marsh Fevers.* By Dr. BURDEL, Physician to the Vierzon Hospital. (L'Union Médicale, No. 139, 1859.)

Dr. Burdel regards marsh poison as a myth, and looks upon marsh fever as a result of a perturbation of the cerebro-spinal centre and the sympathetic system, adopting very nearly the same phrase as the one by which Bernard defines glycosuria. The author of the present paper, in his researches into the nature of marsh fever, has confirmed the above view of its character by ascertaining in the majority of cases the presence of sugar in the urine.

Dr. Burdel employed the test with liquor potassæ, Felling's liquids, the test with bismuth and potash or carbonate of soda, and the yeast test. It was especially in the first commencement of the attack that the quantity of sugar was considerable; it diminished gradually towards the termination of the paroxysm, and generally disappeared entirely during the interval. The closer the attacks approach one another, the larger the amount of sugar.

In 80 cases of well-marked intermittent fever the author uniformly found sugar; in 30 other cases, in which the fever was at first intermittent and subsequently became remittent, the sugar was present, but only in small quantity and for a brief space. In 2 cases of intermittent fever following typhoid fever, a considerable quantity of sugar was shown to be present.

In the cases presenting the largest quantity of sugar, as much as 10 per 1000 was found.

IV. *On Uræmia.* By Professor JAKSCH. (Vierteljahrschrift für die praktische Heilkunde, xvii. Jahrgang, 1860.)

The author of this paper holds that there are two varieties of uræmia which should be carefully distinguished; one being caused by the decomposition of urine and the absorption of carbonate of ammonia into the blood (ammonæmia), the other being the variety which accompanies Bright's disease of the kidneys. He has seen the former occur under the following circumstances: 1. In torpor and paralysis of the bladder; 2. In dilatation of the pelvis and calices of the kidney in consequence of the ureters being blocked up; and 3. In renal abscess, renal tuberculosis, and sacculated kidneys.

The following are the main differences characterizing the two forms of uræmia: we shall, to save circumlocution, use the word ammonæmia as the name of the one, and Bright's uræmia as the name of the other:—

1. In advanced ammonæmia the urine discharged from the bladder manifests a strong ammoniacal odour, which Professor Jaksch has never noticed in any stage of Bright's uræmia. 2. Dropsical symptoms, either acute and febrile, or chronic and afebrile, have not been observed in ammonæmia. 3. Advanced ammonæmia is characterized by persistent dryness of the mucous membrane covering the mouth and fauces, as if every particle of moisture had been removed by blotting-paper; the membrane looks dry and shining, and the dryness even extends to the mucous membrane of the nose, the conjunctiva, and even to the chordæ vocales; these symptoms do not occur in Bright's uræmia. 4. The distinctly ammoniacal odour of the air exhaled, and of the cutaneous secretions of patients affected with ammonæmia does not occur in Bright's disease. 5. Patients suffering from ammonæmia always show a marked dislike to meat, and especially brown meats, even if their affection has not advanced very far; a feature rarely seen in the other variety. 6. Professor Jaksch has never observed in Bright's disease the violent intermittent rigors, simulating intermittent fever, which occur in ammonæmia. 7. In none of the cases of ammonæmia were convulsive or epileptiform attacks, nor croupy or diphtheritic exudations noticed. 8. Disturbed vision, as produced in Bright's disease by exudation on the retina, does not appear to take place in ammonæmia. 9. Chronic ammonæmia is characterized by a uniformly pale and sallow complexion, and by gradually increasing emaciation; very acute and advanced ammonæmia is associated with very rapid wasting of the features, and muscular debility amounting to paralysis. 10. In all cases of ammonæmia which ran a rapid course there was vomiting, with concurrent or consequent diarrhœa; in chronic ammonæmia both phenomena were often entirely absent, or only occurred temporarily. 11. In ammonæmia, whether acute or chronic, Professor Jaksch has always seen death occur after sopor, varying in duration from several hours to several days.

The author of this valuable and interesting paper gives numerous cases illustrative of his views, and enters very fully into the various questions connected with diagnosis and treatment, for which we are unable to make room.

V. *A Contribution to the Statistics of Re-vaccination.* By Dr. MORIZ GANSTER. (Zeitschrift der Gesellschaft der Aerzte, in Wien, 1860, No. 22.)

The author gives the results of 561 cases of re-vaccination performed during the years 1858 and 1859, upon individuals varying in age from three to thirty years. The following are in the main the conclusions drawn from his analysis:

1. More than one-half of the re-vaccinations produced some effect. 2. The result was perfect in but a little more than one-seventh of the entire number. 3. Of all the persons re-vaccinated nearly four-fifths exhibited the scars of previous vaccination; the 21·4 per cent. which showed no marks were not limited to any particular age. The largest number of cases in which the marks were absent occurred in the decennium from twenty to thirty years. 4. When the scars were well marked re-vaccination failed altogether in rather more than

half the cases; it was entirely successful only in one-twentieth. 5. When the scars were imperfect, re-vaccination was successful in one-tenth of the cases. 6. When the scars were altogether absent, re-vaccination produced an effect in two-thirds of the cases; the perfectly successful cases being considerably more numerous than the unsuccessful ones. 7. The ratio of success in these three classes of cases was as 1 : 2 : 7. 8. The following periods are arranged in the order of success characterizing each, commencing with the most successful:

3 and 4 years of age.
25 to 29 „
15 to 19 „
5 to 9 „
10 to 14 „
20 to 24 „

From which table it appears to follow that the protective power of vaccine does not extend only to the fourteenth year, but also to a much higher age.

VI. *Cases of Chronic Pneumonia with Caverns and Peculiar Sputa.* By Dr. Ph. Munk. (Deutsche Klinik, 48, 49, 1859; Schmidt's Jabrb., No. 6, 1860.)

Two cases are detailed in which, during life, elastic fibres were discovered in the sputa of men respectively forty-eight and fifty years of age, in whom after death caverns were found in the lungs without the presence of tubercle. The sputa of the first patient, who had had repeated attacks of hæmoptysis at long intervals, but had only been seriously ill for about nine weeks before his death, are described as being copious, opaque, greenish-grey, consisting of homogeneous, floating, irregular masses, with a few black, millet-sized dots, which broke up on the slide into heaps of pigment granules. The microscope revealed, 1, copious, fine granular matter; 2, a few pus corpuscles; 3, a considerable quantity of free black crystalline and amorphous pigment; 4, numerous elastic fibres. The sputa at the time of examination were regarded as indicating the presence of chronic pneumonia. The description of the sputa in the second case, in which the duration of the entire illness was only a month, is as follows: they consisted throughout of small yellowish-white or dirty green masses. The green masses were not homogeneous, but consisted of numerous threads and shreds, exhibiting under the microscope, 1, numerous pus corpuscles and fine granular masses; 2, numerous free, angular granules of black pigment; 3, simple bundles of fine elastic fibres. We extract the details of the second case as the shortest.

A man, aged forty-eight, a fortnight before admission to the Charité, was suddenly seized with hæmoptysis, returning several times. Ten days after admission his pulse was 96, respirations 36, the skin hot and dry; the body well formed and well fed, the face pale, great collapse. The percussion of the left infraclavicular region was "louder" than on the right; lower down the left side was normal; the left axillary region was deeper-toned and louder than on the right; posteriorly beneath both scapulæ the percussion was loud, deep-toned, not resonant; the left scapular region was decidedly duller than the right; the supra-spinal region was less dull. The respiratory murmur was confused under the left clavicle, but lower down and on the right side it was vesicular. Posteriorly below the left scapula there was vesicular breathing without râles; scanty râles on the right corresponding side; over the left scapula the breathing was vesicular, over the dull parts of the right, uncertain feeble murmur. In the supra-spinous fossæ on both sides the respiratory murmur was weak and indefinite, more so on the left than right side, and there were scanty râles. The fever persisted, the pulse became more frequent, and the dyspnœa increased up to the period of death. The right lung was found to be very large, heavy, and infiltrated with serum. At the anterior margin of the upper lobe was a hepatised spot an inch and a half in length, on section dry, greyish-white, and finely granular. At the apex of the lower lobe was a cavern the size of a walnut, not lined with a membrane, with irregular surfaces owing to projecting trabeculæ and traversing arteries. The cavern contained a dirty, greyish-green liquid, with greyish-white and black shreds corresponding to those found in the expectoration. Similar changes were found in the left lung, but the lower lobe contained more numerous spots of lobular hepatisation, and at its apex there was a cavern twice as large as the one described.

VII. *On Moveable Spleen.* By Professor ROKITANSKY. (Zeitschrift der Gesellsch. der Aerzte, 1860, No. 3.)

Professor Rokitansky gives an account of three cases in which the spleen was found dislocated after death. The first occurred in 1820, in a young woman, aged twenty, in whom the Cæsarean section had been performed; the spleen was found upon the right ilium, attached to a twisted pedicle, and with its hilus turned up and outwards. It was attached above to the omentum majus, and below to the anterior lamella of the broad ligament; it was also adherent to the peritoneum, investing the iliac muscle. The pedicle consisted of the pancreas and the splenic vessels, the former making three spiral coils round the splenic artery. The pancreas was above ten inches long, being drawn out and thinned considerably. The second case occurred in 1826, in a microcephalic female, aged forty-six, with glandular ulceration and tubercles in the liver and lungs; the spleen had sunk down into the left iliac region, being attached to a long pedicle and to the omentum. The third case occurred in 1851, in an insane female, sixty-nine years of age. The spleen lay to the left of the upper aperture of the pelvis, attached by false membrane to the sigmoid flexure and several coils of small intestine. It was attached to the gastro-splenic ligament, which was twisted upon itself, and split up into several strands; the splenic artery was elongated, contorted, and thin, at its division very narrow, and its branches obliterated and here and there ossified. The vein was blocked up in the same way. The spleen was of the size of a goose's egg; its capsule presented cartilaginoid thickening, and was extensively detached from the parenchyma. The pancreas was normal and occupied its usual place.

It is to be remarked that, as in the above cases, dislocation of the spleen almost always occurs in females; the organ generally, though not invariably, descends upon the left iliac fossa, and is commonly brought on by tumefaction of the spleen; doubtless, a want of tone and some irregularity of form in the splenic ligaments contribute to induce the accident. As it descends, the spleen rotates upon itself, so as to twist its pedicle, and narrow or obliterate the vessels. The spleen forms adhesions in its new site, and may remain there for a considerable time; the arrest of the circulation in the splenic vessels induces atrophy and degenerative changes. Death may be brought on by the traction exerted upon the fundus of the stomach, and by the gangrene resulting from the diminished calibre of its vessels.

VIII. *Pathological Researches regarding the Thyroid Gland.* By Dr. EULENBERG, in Coblentz. (Archiv des Vereins für gemeinschaftliche Arbeiten, IV. Band, 3 Heft.)

It appears that the vicinity of Coblentz offers many opportunities for the inquiry into the nature of goitre. With the assistance of Dr. Marfils, the author has for two years examined a large number of thyroid glands, and made hundreds of microscopic preparations. The result of these inquiries is embodied in the above elaborate essay, of which we can only give the briefest extract. The author establishes three chief forms of goitre, according as one of the three anatomical constituents of the gland—the acini, the vessels, or the fibrous stroma—is predominantly affected; they are termed, respectively, 1, struma glandulosa; 2, struma vasculosa; and 3, struma fibrosa.

The varieties of the first form are said to be four:—(*a.*) The struma glandulosa hypertrophica; this is characterized by a uniform enlargement of the thyroid, without any prominences or nodes; the right lobe is more usually affected than the left; in young subjects, and particularly in females at the time of menstruation, this variety is liable to periodic enlargement. A section shows the acini to be uniformly and largely developed; the surface of the section looks uniformly granular, and generally very red and vascular. This variety consists in a dilatation of the pre-existing acini, and in a new growth of acini. (*b.*) The second variety is termed struma glandulosa parenchymatosa, and is found wherever goitre is endemic, or where cretinism exists. The surface of the thyroid is always uneven; nodose projections alternate with softer surfaces. This variety attains a considerable size, and thus becomes a serious impediment to respiration. It is this variety which occurs as a congenital affection. On section, we find an irregular conformation of the parenchyma, some parts being hard and some soft; the cut surface has a pale, dirty yellow and exsangueous appearance; the softened parts show a tendency to disintegration. The acini may be of normal size, reduced, or enlarged, but their contour is always determined with difficulty; the peculiar arrangement of the disintegrated cells and of the free granules in the form of an acinus alone determines the outline. (*c.*) The struma cystica constitutes the third variety. The cysts form globular elevations on the surface, varying in size from that of a hazel-nut to a walnut, and they contain a yellowish or dirty green mucous or colloid liquid. The walls consist of areolar tissue, and may gradually acquire the consistency of cartilage; cysts may also form in consequence of apoplectic effusion. Microscopic examination shows cystic struma to depend upon the enlargement of "sterile" acini, filled with colloid matter. Their fusion induces the formation of a cavity, the inner surface of which is lined with epithelium. The contents are yellow, greenish-brownish red, or black. (*d.*) A fourth variety, the struma cystica parenchymatosa, results from a combination of the pathological conditions characterizing the last two; it has been described by Stromeyer and Rokitansky, but Dr. Eulenberg has not met with an instance, so we confine ourselves to the above statement.

The second form, struma vasculosa, also presents several varieties. The first is characterized by mere hyperæmia, to which the thyroid is very liable, not only on account of its relation to nutrition, but also because, under certain conditions, it is a safety-valve to the brain, by becoming a receptacle of any excess of blood, that would otherwise flow to the brain. In consequence of persistent congestion, hypertrophy may ensue. At the catamenial period, and during pregnancy, congestive goitre is very frequently met with. Rupture of the vessels and hæmorrhage into the tissue of the gland may result from excessive congestion. When the congestion becomes persistent, we have to deal with the second variety of the struma vasculosa, which the author terms struma vascularis parenchymatosa; this resembles the second variety of the first form, with the additional vascular growth; the vessels are varicose and aneurismatic, and are often cretified. In this variety extravasation is very frequent. The third variety of the struma vasculosa is the inflammatory form —a rare event; one that the author has only twice observed. The left lobe was affected in both cases. The first occurred in a woman of forty, labouring under rheumatic fever; the second in a man of fifty-five, in whom an attack of orchitis subsided suddenly, and was followed by acute inflammation of the thyroid. Numerous cases of inflammation and its consequences observed by other writers are given. Dr. Eulenberg admits, as a fourth variety of the form under consideration, the struma aneurysmatica, in which, according to Dr. Walther, the large vessels are aneurysmatic, and the capillaries dilated; it is also associated with cardiac dilatation, severe palpitation, dyspnœa, vertigo, tinnitus, and epistaxis.

The third form of goitre, the struma fibrosa, is characterized by a hard and commonly uniform tumour, which commonly occupies one lobe of the thyroid body. Dr. Eulenberg has not found this form attain a very large size. He regards it as resulting from an inflammatory process, and finds it to consist of new tissue, with dilated acini and brood-cells. The author describes one specimen, as showing ramifications and bundles of elastic and areolar tissue, in which solitary acini were to be found, besides the fine granular mass and a few single-nucleated cells. Besides large brood-cells, there were cells of the size of colourless blood corpuscles, with black granular contents; and some cells containing blood corpuscles. The fibrous struma is sometimes found to contain horn; occasionally it is also seen to ossify.

IX. *Observations on Diphtheria as it appeared in Victoria in* 1859. By J. W. Haddon, M.D. (Australian Medical Journal, April, 1860.)

It is curious to find the epidemic of diphtheria showing itself at the antipodes, as it has among ourselves and among our transatlantic cousins. Dr. Haddon describes 6 undoubted cases of the disease, 2 of which proved fatal, 4 recovering. He very correctly describes two varieties, the one presenting more acute and tumultuous symptoms, the other appearing more insidiously, but nevertheless proving speedily dangerous from the rapidity with which the diphtheritic membrane is formed. The results obtained by Dr. Haddon have satisfied him of the necessity of avoiding antiphlogistic or depressing remedies, and of the propriety of relying from the commencement upon stimulants. The following is a brief summary of the cases:—

1. Boy aged eighteen months, previously in good health, feverish for a few days; on the fifth day, face flushed, pulse full and throbbing, dyspnœa. Sibilant and sonorous rhonchi heard over chest. Fauces full of a tenacious mucus, forming a complete covering to the soft palate and dorsum of the tongue. On clearing out the mouth, the tonsils and uvula were seen covered with a cream-coloured coating, much more tenacious, and to be removed with greater difficulty; the denuded part on the posterior fauces was swollen and bleeding freely. Treatment: blister to throat, antimonial mixture, aperient, followed by wine, beef-tea, chlorate of potash mixture, and nitrate of silver to throat. Death on the seventh day.

2. Like the last, with the same result.

3. Female, aged twelve months. After a catarrh, febricitation with slight croupal cough, inflammation of fauces, with gradually increasing formation of diphtheritic membrane on tonsils and in larynx, from which a long piece of membrane was coughed up, after which convalescence. Treatment: sinapism, ipecacuanha mixture, followed early by chlorate of potash, with sesquichloride of iron and hydrochloric acid, wine and beef-tea being given early and freely. Cure.

4. Female, aged five weeks. Dyspnœa, tracheal cough, difficulty in sucking, no pulmonary affection, but inflamed tonsils, covered in part with greyish-white matter, leaving after removal a bleeding surface. Treatment: chlorate of potash and sesquichloride of iron, beef-tea, local application of solution of nitrate of silver, and hot bran poultices. Cure.

5. Boy, aged six weeks, closely resembling the last case in all respects.

Treatment: hot applications and tinct. iodinii externally; hydrochloric acid and honey, ana, to fauces; chlorate of potash and senega internally, besides wine (about four teaspoonsful in twenty-four hours), beef-tea and milk. Cure.

6. Female, aged four years. Taken ill with feverishness and cough, the day before seen by Dr. Haddon; when examined, the tonsils were covered with cream-coloured membrane, which continued to increase for twenty-four hours, then subsided, and a cure was obtained after a few days, by similar remedies as in the last case.

While we quite agree with the author as to the propriety of the treatment adopted in the four successful cases, we cannot blind our eyes to the fact that they were not very severe cases; and unfortunately we have seen treatment closely analogous to his own, fail in cases of diphtheria, which appeared to set in with an evident tendency to death from the commencement.

X. *Anatomical Description of an Acardiac Monstrosity.* By Dr. Spliedt. (Archiv für Patholog. Anat. und Physiol., Band xviii., Heft 3 & 4.)

The subject of this memoir was born with a healthy, well-formed twin sister in 1856 at Itzehoe. The healthy child, as is always the case, made its appearance first. The placenta belonged to both, was normal in structure, but larger than usual. The chorion belonged to both; there was a double amnion, and the septum between the two fœtal cavities was formed by the union of the two amnia. The umbilical cords had an eccentric insertion, at a distance of nine centimètres from each other. The umbilical cord of the healthy child contained two arteries and one vein; the others only one artery and one vein. There was a complete anastomosis of the placental vessels; the entire capillary system of the placenta belonged to the healthy child. The circulation of the acardiac fœtus could only take place thus: a part of the blood that passed through the umbilical artery of the healthy child into the placenta, passed at once into the umbilical artery of the acardiac fœtus, and after nourishing it, returned by its umbilical vein directly into the umbilical vein of the healthy child. The following are some of the chief features of the monstrosity.

Its external form was that of a flattened, lens-shaped body, with a deep furrow on one side; it was covered with a normal cutis; there were indications of a mouth, and of the auditory meatus in the upper division caused by the furrow. Two wart-like projections appeared to indicate the lower extremities. The dissection exhibited an imperfect vertebral column, consisting of sixteen vertebræ, with ribs and half an inferior maxilla. The cervical vertebræ were absent; eleven of the dorsal vertebræ with their ribs were present, all of which, as well as the ribs, which differed considerably from one another, are minutely described. A rudimentary sternum and pelvis were also present. The muscular system was even less developed than the osseous; though some striped muscles were discovered between the ribs. Of the viscera nothing was found, except a very imperfectly-developed intestine and a rudimentary kidney; all other thoracic and abdominal organs were entirely absent. The surface of the intestine was smooth and shining. It consisted of two parts, the larger about an inch long, the smaller about the size of a bean, connected with one another by a mere filament, the result of obliteration of the communicating intestine. The intestinal contents were a brown viscid mass, consisting chiefly of fat and epithelium. There was no trace of spinal cord, but peripheric nerves were found in several parts. Only a very imperfect injection could be made, but so far as could be determined, the following was the distribution of the vessels; the umbilical vessels entered on the left side immediately above the first rib; the artery most internal, the vein external. The artery ran downwards and to the right, giving off a larger branch to the left side, from which, as well as from the main branch, small twigs, corresponding to the intercostal arteries, pass to the ribs and supplied their muscles. The chief branch broke up into its terminal branches near the last rib on the right side. Above the artery gave off a large branch to the inferior maxilla, running straight upwards; it supplied partly the bone, partly the surrounding skin. The vein presented the same relations as the artery. The areolar tissue occupying the trunk of the monstrosity was traversed by numerous branched intercommunicating channels, with smooth walls and valvular projections, which must be regarded as venous caverns.

QUARTERLY REPORT ON SURGERY.

By John Chatto, Esq., M.R.C.S.E.

I. *A Simple Mode of treating a frequent form of Entropion.* By M. Sichel. (Bulletin de Thérapeutique, tome lix. p. 59.)

There are varieties of this affection which only yield to appropriate operative procedures, but there is one form which almost always precedes the others, and which can be relieved in the great majority of cases by very simple means. It is well known that in ophthalmia accompanied by violent photophobia, and by great distension of the vessels of the conjunctiva, the patients insensibly acquire the habit, especially when the inflammation has become chronic, of strongly contracting the eyelids, with the double aim of excluding the rays of light and of expelling the foreign bodies which, from their sensations, they believe to be present at the front of the eye. This constant contraction of the orbicularis at last inverts the free edge of the lower eyelid, the very narrow tarsus of which yields more readily to the blepharospasm than that of the upper eyelid, which has a more considerable vertical diameter. After a while the cartilage of the lower lid can no longer resist this incessant action, and it undergoes an incurvation which becomes more and more considerable, until at last complete inversion is produced. When the affection has attained this degree, the means now to be mentioned are usually of no avail.

The entropion is confined in most cases to the lower eyelid. It is most frequently so after chronic ophthalmia and the operation for cataract, when the patient, either from indisposition to open them or from excessive sensibility of the retina, keeps the eyelids too long closed. In this variety of entropion, termed spastic, the advice is usually given to practise frequent tractions on the lower eyelid, or to keep it everted on the cheek by means of adhesive strips. In the author's hands these means, powerless against the permanent contraction of the orbicularis, have always failed, while a very simple manœuvre has generally succeeded. In place of producing complete abduction and depression of the eyelid, it should be only moderately depressed, and stretched vertically by means of the index and medius fingers, so as to sensibly separate it from the anterior surface of the eye. The pulp of one of the fingers is next applied above the inferior edge of the orbit, upon the adherent part of the eyelid, and gently carried from before backwards, into the anterior portion of the cavity, until the free edge of the eyelid is strongly everted. The pressure must be made very gently, the finger sliding along the anterior portion of the floor of the orbit without compressing or irritating the globe. This simple manœuvre, repeated every quarter of an hour or oftener by the patient himself, leads to the re-establishment of the eyelid in its normal position. The same procedure, with some modification, may be advantageously employed for the treatment of entropion of the upper eyelid—an affection which, indeed, is much more rare, and infinitely more difficult to cure.

II. *On a Case of Fistulous Opening in the Stomach successfully treated.* By Dr. MIDDELDORPFF. (Wiener Medicinische Wochenschrift, Nos. 3, 4, 5, 6.)

Dr. Middeldorpff prefaces the account of this case by some historical notice of the subject. By diligent search he has only been enabled to find recorded 47 cases of *fistula ventriculi externa*. Of these, 21 occurred in males and 24 in females, the ages of the subjects ranging between nine and eighty years. In 9 cases death ensued, in 22 the fistula remained unhealed, and in 11 it was healed. In several of the cases the affection continued for years without the general health suffering materially, while in others the whole duration of life was attended with pain and emaciation.

The author's patient was born in 1812, and has borne several children. In 1832 she first commenced suffering from severe pain in the region of the stomach, which recurred always at the same spot at intervals during the next twenty years. In 1852, after a great aggravation of suffering, an opening formed, from whence after a while food was discharged. The author saw the patient in 1855. The fistular opening was placed between the cartilages of the sixth and seventh ribs, a little distance below the left mamma. The fissure-shaped aperture was about two lines in breadth and three centimètres in length, transverse, and somewhat arched, with its convexity downwards. The edges were red and callous, and unprovided with mucous membrane. The aperture was too narrow to admit of inspection of the stomach, but at its deepest part a dependent uvula could be descried, which moved synchronously with the pulsation of the heart. The fistula was therefore placed in the immediate vicinity of the pericardium, and penetrated the anterior edge of the diaphragm uncovered by the pleura, implicating, if not the fundus, the external left half of the corpus ventriculi in the vicinity of the cardia.

A palliative treatment was long persisted in, consisting chiefly in means calculated to support the patient's strength, and in mechanical appliances for preventing the discharge of alimentary substances and the gastric fluid through the aperture. Tired out at last by the cares required and the unsatisfactory results, the patient besought that an operation for a radical cure should be attempted. This was performed, without the aid of chloroform, November 10, 1857. A parallel, semicircular incision having been made at some distance below the fistula, the intervening flap was separated, undermined, and slid upwards so as to admit of the edges of the fistula, first freshened, being brought into immediate contact, in which condition they were kept by means of five twisted sutures. We need not follow the long details given on the progress of the case; it suffices to say that when seen in August, 1859, the whole surface had long become firmly united, with the exception of one fistular point half a pin's head in size, through which a little mucus issued, and, on the occasion of a cough, a little food. The general condition of the patient had undergone improvement.

III. *On Prostatorrhœa.* By Professor GROSS. (North American Medico-Chirurgical Review, July, pp. 698–9.)

Dr. Gross believes that the affection which he thus designates has not received any attention from writers on surgery, it having been confounded with other lesions, such as gleet, chronic urethritis, seminal losses, or cystorrhœa. It is, however, a thin mucous discharge from the prostate dependent upon irritation, if not actual inflammation, of the component tissues of the gland. Dr. Gross has not met with it in the very young, although it may probably be present in cases in which the prostate suffers from reflected irritation, as in stone, prolapsus ani, or worms. After the twentieth year it becomes sufficiently common, and it is occasionally seen in the aged. It seems to be most frequently met with in persons of a sanguineo-nervous temperament, with strong sexual propensities leading to frequent venereal indulgence or to masturbation. The single and the married seem equally prone to it. The exciting causes are not always very evident, but in most of the author's cases the affection was traceable to venereal excesses, chronic inflammation of the neck of the bladder, stricture, or other disease of the urethra, while in some cases it depended upon affections of the lower bowel. It may be occasionally excited temporarily by the exhibition of certain internal remedies, as drastics, cantharides, or turpentine. Many of the most obstinate cases that have come under the author's notice have been the direct results of masturbation.

The discharge is in general perfectly clear, and more or less ropy, and it may vary in quantity from a few drops to a drachm and more in the twenty-four hours. It is very rarely puriform. The most copious discharges usually take place while at stool. There is often a peculiar tickling sensation, spreading from the region of the prostate along the urethra. There may be more or less uneasiness in voiding urine, and a frequent desire to pass it, while some patients are tormented with morbid erections. The patient's mind often suffers much from the alarm which the discharge gives him, owing to his fears of its leading to impotence. In some instances all business habits become destroyed, the patient incessantly dwelling upon his complaint.

From urethritis, whether common or specific, it may usually be distinguished by its history, the nature of the discharge, and the attendant phenomena. It usually comes on gradually, and there is seldom any evidence of inflammation. The diagnosis in gleet is sometimes more difficult; but besides the history of the case, the discharge is in gleet usually puriform and more abundant. Many patients confound the discharge with a flow of semen, and the ignorance of their attendants often encourages the error. According to Dr. Gross' experience, diurnal spermatic emissions are amongst the rarest occurrences met with in practice; and the discharges, said to be semen, forced out while at stool, are usually simply prostatic. In cystorrhœa there is an inordinate secretion of mucus, associated in nearly all cases with an altered condition of the urine, frequent and difficult micturition, and more or less pain, together with constitutional disturbance. In prostatorrhœa there may also be more or less uneasiness low down in the pelvis, with trouble in voiding the urine, especially where the prostate is much enlarged; but the two disorders are so widely different that it is impossible to confound them. Although the disease is probably of a true inflammatory nature, there are cases, and these by no means uncommon, in which the gland is to all appearance entirely healthy. "The discharge in such seems to be solely the result of a heightened functional activity, probably connected with, if not dependent upon, disorder of the seminal vesicles, the urethra, neck of the bladder, or recto-anal structures; in other words, upon reflected irritation, or, as our professional forefathers would have denominated it, sympathetic disturbance." The prognosis is generally favourable, but the obstinacy of the affection is often very great; "and hence the surgeon should always be guarded in the expression of his opinion respecting a rapid cure. When the mind deeply sympathizes with the local affection, as is so frequently the case, especially in young men of a nervous, irritable temperament, there is no disease which, according to my experience, is more difficult of management, or more likely to result in vexation and disappointment."

In treating the affection, we must make a thorough exploration of the genito-urinary apparatus and of the rectum, by means of the catheter and the finger introduced *per anum*. This last is of great importance in order to render the examination satisfactory. If disease of the seminal vesicles exist, it will usually be evinced by tenderness on pressure through the wall of the bowel, provided the finger is sufficiently long, or the prostate is not too voluminous. The habits of the patient, too, must be well inquired into, as sexual excesses keeping the prostate, vesicles, and adjoining structures in a state of continual excitement, are very likely to give rise to prostatorrhœa. Having ascertained the local and general condition of the patient, our means of treatment must be in part directed to the system at large, and in part to the structures themselves. In many cases, the enfeebled state of the patient indicates the propriety of giving tonics and a nutritious diet. One of the best preparations of iron is the tincture of the chloride in union with that of nux vomica, in the proportion of twenty drops of the former to ten drops of the latter four times a day. If the patient be plethoric, we may with great advantage give small doses of tartar emetic, care being taken not to nauseate. In all cases it is of importance to maintain the secretions in an orderly state, drastics being avoided. Condiments and high-seasoned dishes should be abstained from. Among the more important topical remedies are—first, moderate sexual intercourse, as a means of allaying undue excitement; and next, cooling and anodyne injections, or weak solutions of nitrate of silver and laudanum. The author generally prefers Goulard's extract with wine of opium, in the proportion of from one to two drachms of each to ten ounces of water, thrown in forcibly with a large syringe three times a day, and retained for three or four minutes. In obstinate cases, cauterization of the prostatic portion, or even the whole length of the urethra may be required once a week. The cold hip-bath should be used twice in twenty-four hours, the lower bowel kept cool and empty; and if the disease do not gradually yield, leeches should be applied to the perinæum and around the anus. Whatever plan be tried, perseverance and occasional change of remedies are indispensable; and when the mind has become deeply involved in the contemplation of the case, it becomes almost impossible to convince the patient he is well, or that nothing serious is the matter. Our chief dependence then should be placed on travel, and entire change of scene and occupation. If the patient be single he should be enjoined to marry.

IV. *A New Mode of making Pressure in Popliteal Aneurism.* By Dr. Moffatt. (American Medical Times, No. 2, p. 23.)

Dr. Moffatt thus describes an apparatus for making compression in a popliteal aneurism, which is a modification of one already employed by Dr. Fountain. "In a few minutes, with the aid of a carpenter, we erected a structure consisting of a stick of timber about four inches in thickness by eight in width, one end of which was secured to the top by an upright post of the same dimensions. This post was fastened firmly to the floor, and lashed to the iron cross-bar at the head of the bed. It was about six feet in height, and bevilled at the top to receive the stick first-named, these being firmly nailed together. The large piece of timber, about twelve feet in length, rested at the lower end upon a strong table placed at the foot of the bed, thus forming an inclined plane over the bedstead placed lengthwise beneath it. The patient was then placed upon the bed in the supine position, with his leg slightly flexed, somewhat everted, wrapped in thick layers of cotton, and placed in a long fracture box. A compress made of adhesive plaster wound tightly into a roll about an inch in length and three-eighths of an inch in diameter, was then placed over the femoral at the inferior angle of Scarpa's space. Upon this rested the lower end of a perpendicular piece of wood, about an inch square, the upper end of which was bevilled to meet the inclined plane before described. The pressure was commenced at eight in the morning. Its degree was regulated by drawing the upper end of the perpendicular down the inclined plane, to a greater or less extent as might be required. The hand of the operator was kept upon the stick, and thus secured an equable pressure, even though the patient moved his limb, as he sometimes did a very little. A second compress and upright were placed over the artery as it crosses the horizontal ramus of the pubes, and when the pain from pressure on one was too great to be borne comfortably, the other was used; and thus alternately pressure was kept up until five in the evening, when pulsation could no longer be felt in the tumour. Moderate compression was kept up for eight hours longer, after which the patient was kept for several days quietly on his bed. The great simplicity of this plan of compression, which is always available, must be palpable to every one. That it is far easier for the patient, and unspeakably more so for the operator, cannot be questioned. It would also seem reasonable to infer, that the compression itself, made but at one point, is more uniform and certain than has yet been secured by any other method."

V. *On the Limits within which "Ecrasement Linéaire" should be employed.* By Dr. Oscar Heyfelder. (Medicinische Zeitung Russlands, No. 21.)

The chief grounds for preferring the employment of "écrasement linéaire" are stated to be the avoiding the loss of blood, and the possibility of operating upon spots accessible with difficulty or inaccessible to the eye and the hand. On examining these pretensions more closely, we find that hæmorrhage is only absolutely avoided when the structures operated upon possess but few blood-vessels, or when the crushing process is carried on only at considerable intervals. When parts are not very vascular, their division with the knife gives rise to no dangerous hæmorrhage; while when an hour or two is occupied in dividing thick textures by the écraseur, it becomes a matter for consideration whether the patient and the operator will have the necessary patience and time; the former having also to suffer no inconsiderable pain, or to be kept for a prolonged period under the influence of anæsthetics. The possibility of removing by means of the écraseur growths which are only accessible with difficulty must be admitted; and it is thus well suited for the extirpation of tumours or growths of the rectum, vagina, uterus, and pharynx. There are, however, also disadvantages to be taken into consideration, such as the impossibility of obtaining primary union, or of maintaining a cutaneous covering over the wound, the prolonged duration of the operation, and the impossibility of following tumours which have their bases placed within the interstices of muscles or bones.

The rational practitioner will therefore confine this operation within narrower limits than have been sometimes assigned to it. It is indicated: 1. In all cases in which a great hæmorrhage, or one which there may be difficulty in arresting, is to be feared. For example, in the case of the highly vascular tumours, or in organs which have become abnormally vascular, in persons who have little blood to spare or who are liable to hæmorrhagic action, in new-born infants, when the means for arresting hæmorrhage are not attainable or are not easily applied, and when even a slight loss of blood during an operation may be dangerous, as in laryngeal polypi. 2. When the employment of the hand, guided by the eye, is more or less difficult or impossible, as in uterine fibroid and polypus of the larynx. 3. When no ill-consequence is to be feared from the prolongation of the operation. 4. When the cutaneous covering does not require to be preserved. It is therefore better adapted for submucous and pediculated tumours than for subcutaneous and broadly-rooted tumours. 5. When contraction from cicatrices will not induce deformity or disturbance of function. 6. When healing by primary intention is not desired. In all cases wherein one or more of the above indications do not prevail, the knife is to be preferred as an easier, more expeditious, and less mechanical method, and one which is often more certain and less dangerous in its action.

VI. *Case of Separation of the entire Alveolar Process of the Upper Jaw.* By Dr. C. GUENTHER. (Varges' Zeitschrift, Band xiv. s. 174.)

A workman, while employed in the construction of a stone bridge, was struck in the face by the angle of a large mass of stone. He remained senseless, owing to the hæmorrhage, for a quarter of an hour, and three hours later was seen by the author. After clearing out the coagula from the mouth, which almost obstructed respiration, the injury was found chiefly to consist in the complete separation of the alveolar process of the upper jaw, the entire arch, in an unbroken state, lying on the lower jaw, only suspended by some shreds of the gum and soft palate. A wound two inches long opened a passage through the upper lip into the nostril. The displacement was reduced with unexpected ease, and the molars being in good condition, pressure was kept up against them by means of the lower jaw. The incisors were carious, and those of the lower jaw had been driven out by the accident, so that a capacious opening existed, admitting of the removal of the accumulated blood from the mouth and of the administration of semi-fluid food. Owing to the destitute condition of the patient it was difficult to obtain material for effectually securing the motionless state of the jaw by means of bandages. However, so rapidly did the healing process take place, that in seventeen days the man was enabled to commence trying to chew, and on the twentieth day was again at his work; repaying the author's care by neither fee nor thanks.

VII. *On Ligature of the Primary Iliac Artery.* By Dr. STEPHEN SMITH. (American Journal of Medical Science, vol. xl. pp. 7-46.)

Dr. Smith having a short time since had occasion to tie the primary iliac artery, has been induced to collect and analyse the histories of the other cases which have been published. He observes that the aphorism, that the success of the operation of securing arteries diminishes as we approach the centre of circulation, applies with especial force to this one; for while tying the external iliac is attended with a mortality of twenty-eight per cent., ligature of the common iliac is followed by a mortality of seventy-seven per cent. Although Gibson of Philadelphia first performed the operation in 1812, in the case of a wound, it was Mott who, in 1827, first deliberately planned and executed it; his, too, being the first successful and still living case. The cases which Dr. Smith has been enabled to collect from the time of Gibson to now, are 32 in number, of which 15 have occurred to American surgeons, 2 to South American, 10 to British, 2 to French, 1 to German, and 2 to Russian surgeons. References are made by some authors to other cases as having occurred, but of these no published accounts are accessible. He arranges the cases into four groups.

1. *The ligature applied for the arrest of hæmorrhage:* 11 cases and only 1 recovery. The success of this operation presents a marked contrast with that of ligature of the external iliac for the arrest of hæmorrhage; for of 14 cases of his, 11 were successful. "A proper appreciation of the circumstances under which the primitive iliac artery has been tied for the arrest of hæmorrhage will lead the discriminating surgeon, notwithstanding the excessive mortality that has thus far attended its performance, to accord to this operation an important place among the resources of his art. In the immediately fatal cases, the patient was already excessively prostrated by the hæmorrhage, and the operation has been performed when a fatal termination appeared inevitable; but even in these cases it has relieved the most threatening symptoms, and given promises of successful results. In the remaining cases, the fatal issue has been due to causes unconnected with the operation itself, but referable to some intercurrent affection."

2. *The ligature applied for the cure of aneurism:* 15 cases, fourteen times in males and once in a female. There were five recoveries; one permanently cured, two temporarily, and two issue unknown. There died ten. Of 95 cases of ligature of the external iliac for aneurism, 69 recovered and 26 died, being a mortality of about twenty-seven per cent., or less than half the mortality after ligature of the common trunk. The cause of death in eleven cases, or nearly one-half, of ligature of the external iliac, was mortification of the limb, while there was but one instance in 8 cases after operation upon the primary iliac.

3. *The ligature applied for malignant tumours simulating aneurisms:* 4 cases; 1 recovery and 3 deaths.

4. *The ligature applied for the prevention of hæmorrhage in the removal of a morbid growth:* 2 cases, both fatal.

Of the 32 cases, the subjects were males in 27, females in 3, sex not stated in two; and in 24 of the cases, aneurism led directly or indirectly to the operation, the right external iliac artery being diseased in eleven of the instances, and the left but in 7. In 17 cases, the right common iliac was tied with 3 recoveries; and in 13, the left common iliac, with 1 recovery. Of the 32 cases, 25 died and 7 recovered, being a mortality of about seventy-eight per cent., as compared with the twenty-eight per cent. after ligature of the external iliac. Since the year 1845, none of the 16 cases of operation on the common iliac have recovered. Dr. Smith points out that the text-books on surgery, e.g., those of Erichsen and Gross, give a far more favourable account of the results of this operation than is justified by facts.

As to the mode of performing the operation, Dr. Smith gives the following directions—"Before proceeding to the operation which it fell to my lot to perform, I put these various methods to the test upon the cadaver, and after repeated trials, came to the conclusion that the following incision gave the most direct and easy access to the artery. Commence the incision just anterior to the extremity of the second false rib (eleventh), and terminate it just above the internal ring by a sharp curve inward of one inch. This incision will be about seven inches in length, and will pass about an inch and a half within the anterior superior spinous process. The curve at the lower extremity will allow the most perfect freedom in the elevation of the peritoneum and the complete exposure of the artery."

VIII. *On Foreign Bodies accidentally introduced into the Bladder.* By M. Civiale. (Bulletin de l'Académie de Médecine, tome xxv. pp. 791 and 824.)

M. Civiale conjoins some interesting remarks to a case of this description, which he communicated to the Academy. He observes that the effects which result from these introductions are very various, one of the most constant and the most remarkable being the sudden change in the composition of the urine. The phosphatic element almost immediately predominates in an abundance which would excite surprise, did we not bear in mind that, under the influence of gout, rheumatism, or various conditions of the urinary apparatus, and sometimes without any appreciable cause, almost the whole of the urine becomes transformed into a soft earthy substance, with a tendency to solidify and form enormous masses of amorphous deposits.

With respect to the treatment of these cases, there are two classes of patients. In the first of these, the contact of the foreign body gives rise directly to such severe symptoms as at once to compel us to proceed to its extraction. The surgeon is then usually enabled to direct his procedures beforehand, so as to assure the necessary precision and safety in the manœuvres to be employed. Among the patients of the second class, who have introduced these bodies voluntarily, some suffer but little at first, while others bear up against the pain, in order not to have to confess its cause. Such cases do not come under treatment until more or less time had elapsed since the accident, and then they do so either as stone cases, without any indication of the original cause of the malady, or even with attempts at deception respecting this. In any case, the surgeon has to do with a vesical calculus, and treats it according to the indications. Under favourable circumstances, the foreign body constituting the nucleus of the calculus does not present either in its nature or its size any obstacle to the operation; and it is only discovered later amidst the *débris*, or in the centre of the calculus. In other cases, the crushing the stone is not attended with any unusual difficulties, but during the search made for the fragments, the instrument comes in contact with a body which gives a different sensation to that derived from a calculus. M. Civiale refers to cases in which he has thus had to extract portions of bone, a piece of tendon, a medallion, &c.

The new case which he relates to the Academy is of a similar description. A woman, forty-nine years of age, the mother of six children, and obliged to lead a laborious life, was admitted into the author's hospital, exhausted with pain and sleeplessness, dependent upon the presence of stone. Six months previously a calculus had suddenly obstructed the urethra, and was crushed and expelled; and a month later, retention of urine had been produced by a tuft of hair agglomerated by a soft matter, and covered by an earthy incrustation. Soon after her admission into the hospital, a large friable calculus was easily crushed, but on closing the instrument, it was found to include a hard body, which on its withdrawal proved to be a small human tooth. A few days later, two other teeth were withdrawn, and soon afterwards another, a portion of bone, and a large amount of stony fragments. The woman rapidly recovered. Small bones and teeth have been found in the bladder by various surgeons, while others have also indicated hairs as forming the nuclei of calculi, or as being found in the bladder. In the present case, these teeth and hair doubtless proceeded from a communication having been formed between an ovarian cyst and the bladder; but there is this remarkable about it, that there was no disturbance in the health of the patient during the establishment of so important a pathological condition. Seven months prior to the operation, she was perfectly well, and so she has continued since its performance, her only suffering having been caused by the consecutively-formed calculus.

In the above communication, M. Civiale, speaking of the introduction of foreign bodies by the urethra, observed that the displacement of such bodies depends upon their point of departure; all bodies which have become engaged within its internal orifice proceeding from behind forwards, independently of the vesical contractions, whilst their natural course is from before backwards when they penetrate by the external orifice. To this statement M. Ségalas enters his protest, observing that every one must have remarked that from among the numerous series of foreign bodies introduced from without, several of them, so far from proceeding towards the bladder, tend to the opposite direction. He refers to two examples which he recently presented to the Academy, in which hair pins introduced into the urethra had, by reason of their movement from behind forwards, become engaged by their points in the glands. Every surgeon has seen bougies expelled outwardly after having reached the prostatic portion of the urethra; and as far as we can judge by the sensations of the patient, calculi, or their fragments, after having become engaged in the deep-seated portion of the urethra, have re-entered the bladder, or they have remained *in situ* until removed by surgical interference. In fact, the direction which these foreign bodies take in the urethra is not dependent upon their mode of entry, but upon their form, size, actual position, and other circumstances. Bodies of a small size, occupying the bulbous or spongy portion of the urethra, whatever their source, have a tendency to pass by the meatus, especially when their form is roundish. Other foreign bodies of a long, thin, or cylindrical form, as bougies and catheters, passed into the membranous part of the urethra, may become, so to say, seized by this muscular ring and drawn towards the bladder. Moreover, this movement may be favoured by the dependent position of this reservoir in relation to the urethra, and by the greater separation of its walls. When turgescence of the penis exists, as is the case when foreign bodies have been libidinously introduced, a foreign body near the meatus easily disappears, and is carried inwards during the retraction of the organ. By a similar mechanism strictures may favour the progress of the bodies towards the interior, or impede that of those directed externally. The imprudent manœuvres of the patient, or the inexpert procedures of inexperienced surgeons, only too often also accelerate the progress of foreign bodies towards the bladder.

IX. *On the Excision of In-growing Nail.* By M. Allix.

(Moniteur des Sciences Médicales, No. 88.)

After treating in-growing nail by the various means which have been recommended, M. Allix gives a decided preference to the following procedure: "One of the blades of a straight pair of scissors is slid beneath the nail, along its in-growing edge, down to the bottom of the groove, and by the closure of the other blade this lateral slice is detached, and may be easily removed with a forceps. Next, the end of the nail is seized by a forceps at the bottom of the groove, and a triangular portion is removed by an oblique stroke of the scissors. There is now no portion of the nail which penetrates, and the wound has time to cicatrize before a new nail is formed. This operation presents all the advantage of the complete removal of the nail, but it is neither so painful nor so alarming; it can be performed without chloroform, and the cicatrization is more rapid than when the soft parts are excised. But to be of use, the incision must have extended to the bottom of the groove, and we may know that this has been the case if we find that with the root of the nail the reflected portion of epidermis is brought away. The operation cannot always be completed in this way, as when the nail is fragile it cannot be divided at the first stroke of the scissors to the bottom of the groove. It must then be seized as deeply as possible by the forceps, so as to draw outwards the angle which is wedged in the soft parts, and then separated obliquely by means of the scissors. When the nail is affected on both sides, and so changed in form as to render the above procedure painful and tedious, complete removal becomes the preferable operation.

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D., F.R.C.P.
Physician to the Royal Maternity Charity, Assistant Obstetric Physician to the London Hospital, &c.

I. Pregnancy.

1. *On the Continuance of Ovulation during Pregnancy.* By Scanzoni. (Beitrage, Band iv., 1860.)
2. *Extra-Uterine Pregnancy continuing Three Years and Six Months; Fœtus removed by Gastrotomy.* By C. Goodbrake, M.D. (Boston Medical and Surgical Journal, July, 1860.)
3. *Sudden Death from Entrance of Air into the Uterine Veins and Heart of a Pregnant Woman.* By M. Depaul. (L'Union Médicale, July, 1860.)

1. Professor Scanzoni enters into some speculations concerning the continuance of ovulation during pregnancy. His opinions have been recently

contested by Kussmaul. Scanzoni argues, that since the bursting of the Graafian vesicle and its consequences are entirely the result of the menstrual hyperæmia of the ovarium, and that the latter can differ greatly, the conclusion must be granted that the menstrual prolegomena are not always or necessarily connected with a bursting of the follicle which embraces a ripe ovum. He reasons ingeniously to prove, that although he is unable to show fresh-burst Graafian vesicles in pregnant women, yet there are strong grounds which render it more than probable, that there persists a periodical ripening of ova during pregnancy, although without bursting of the follicle. But the reasoning is essentially speculative, and takes too little account of opposing facts.

2. It is of great interest to collect cases illustrating the natural history and treatment of extra-uterine pregnancy. Dr. Goodbrake, of Clinton, Illinois, contributes a case of unusual importance. The patient, a lady, aged forty-three, had had nine children, the youngest being about six years old. About April, 1856, she supposed herself pregnant, and in the fifth month she felt fœtal movements. In December, strong bearing-down pains came on; she was thought to be in labour, but the pains subsided. Occasional bearing-down pains recurred for the next three weeks, at the end of which time she was again thought in labour, and again the result was the same. From this time pains recurred; many physicians were consulted. She now menstruated regularly; constant pains and anxiety were attended by great wasting and loss of strength. She says that up to the time when she considered herself at full period, and for some time after, her abdomen was elastic and of uniform size; but after that time it became gradually harder and of irregular shape—the bulk of the tumour occupying the right side. For some time after her expected confinement her breasts secreted milk. There was a large tumour occupying the right side, extending from the iliac fossa to above the umbilicus, and a little to the left of the linea alba; it felt hard and somewhat irregular, and *appeared* to be moveable to some extent. *Per vaginam*, a tumour was felt, round, smooth, and occupying the pelvic cavity; it impinged firmly on the right side, but the finger could pass between it and the wall of the pelvis on the left. The uterus occupied a position to the left and behind the tumour. A catheter passed into the urethra went behind the tumour, indicating that both uterus and bladder were crowded from their true position. The patient was very anxious to have what she was convinced was a fœtus removed by operation. This course was carried out on the 24th October, 1859. Under influence of ether and chloroform, an incision was made in the linea alba about four inches long, down to the peritoneum; no hæmorrhage; the peritoneum was therefore also incised. The hand, previously smeared with artificial serum, prepared according to the direction of Dr. Peaslee, was introduced into the abdomen. A sac was traced, firmly adherent in the right iliac fossa, and to a considerable extent to the parietal peritoneum on the right side; there were no adhesions anteriorly, nor to the intestines, which were all crowded to the left side. A small incision was made in the sac, and a fœtus was found in a pretty good state of preservation. Incisions were extended through abdomina walls and sac, from umbilicus to near pubis. The fœtus was removed with great difficulty, owing to strong adhesions between it and the sac. The cord was still attached to a very small placenta of a cartilaginous character, seated low down in the pelvis, and immediately over the space where the sac also adhered to the broad ligament. The uterus was a little enlarged. The cord, as much of the placenta and sac as could be got away without lacerating the peritoneum, was now removed, the parts carefully sponged, and the incision brought together by interrupted suture. It was estimated that not more than an ounce of blood was lost. The after-treatment consisted in the administration of brandy and opium. The patient appeared to do well for forty-eight hours,

prostration then set in, and she sank on the fifth day. An autopsy was refused.

[It will here be useful to append a reference to the recent case of extra-uterine gestation in which the fœtus was removed by abdominal incision at the London Hospital. The patient was under the care of Dr. Ramsbotham, and the operation was performed by Dr. Adams. In this case, Dr. Ramsbotham determined that neither the sac nor the placenta ought to be removed. The operation was fully successful; the patient recovering without a bad symptom. The placenta probably came away by a process of gradual disintegration and liquefaction. The interference with the placenta and sac may explain the unfortunate termination of Dr. Goodbrake's case. Dr. Ramsbotham's case is fully reported in the 'Lancet,' and in the 'Medical Times and Gazette' for June and July; and we may also call attention to a very excellent summary of cases by Mr. Hutchinson in the latter journal.—Rep.]

3. Dr. Parmentier relates an important case of sudden death from entrance of air into the uterine veins and heart in a pregnant woman. The case happened in the practice of M. Depaul. The patient was in her fourth pregnancy; being rachitic and the pelvis deformed, her first labour, at term, was completed by craniotomy; her second was also completed by craniotomy, although labour had been induced by the vaginal douche at the eighth month; her third pregnancy terminated by abortion. Her fourth pregnancy having reached the eighth month in June, 1859, it was determined to bring on labour by the vaginal douche. The instrument of Mathieu was employed for this purpose twice; some pain and contractions followed. The instrument then failing to act, M. Depaul used the clyso-pompe of the Clinique d'Accouchements, which consists of two tubes, of which one is plunged in the reservoir of water, and the other, much longer, is introduced into the vagina. His finger placed against the cervix uteri, the operator slipped up the canula, but kept it at a distance of between one and one and a half centimetre from the os uteri. At first nothing particular occurred beyond some pains; then, four or five minutes later, a particular sound was heard announcing that air was escaping; nevertheless all the parts of the apparatus were in order; the aspiratory tube was perfectly under water; satisfied that the instrument worked properly, the operation was continued. For some instants all went well, but later a gurgling noise was produced in the vagina, and the patient at the same time complained of much more severe pains; M. Depaul encouraged her, and went on. For a third time air escaped from the tube with the water, and gurgling was produced in the vagina. The canula was withdrawn, and the patient was told to get up and walk a little; but at the moment of trying to rise, she became pale and fell back; the radial pulse had become imperceptible and the heart had ceased to beat. For twelve minutes attempts were made to restore her, but all was useless. She made three imperfect inspirations, which excited a gleam of hope, but the third inspiration was her last.

Hoping to extract a living child, M. Depaul proceeded immediately to the Cæsarean operation. Having cut down to the uterus, instead of finding it of a reddish-brown or blackish colour, as is always the case when the Cæsarean section is performed, it was rosy, pale, discoloured. A first incision engaging only a part of the thickness of the uterine wall, allowed the escape of a sanguinolent froth, instead of a flow of black blood as is usual. At each incision of the uterine wall there escaped blood in less quantity, and from time to time bubbles of air; at last, at the moment when the bistoury penetrated the uterine cavity, there issued through the lips of the wound a certain mass of air coming from the womb, where it had been contained between the membranes and the inner surface of the organ, for the membranes were still intact. M. Depaul then opened the sac of the membranes, and met at first the arm of a fœtus whose head was in the lower part of the uterus. He instantly extracted the child—a girl—it gave no sign of life. Under restorative means, however, it breathed, but lived only fifteen hours. M. Depaul then proceeded to extract the placenta; he found it detached to a small extent; in proportion as he detached it, there escaped blood and bubbles of air, which were between the inner surface of the uterus and the placenta. It is regretted that an autopsy was refused by the family. It was concluded that the partial separation of the placenta had permitted the introduction of water and air into the uterine sinuses, whence air penetrated into the torrent of the circulation.

II. LABOUR.

1. *On Puerperal Salpingitis.* By VOCKE. (Mediz. Vereins Zeits., No. 4, 1860.)
2. *Nineteen New Cases of Eclampsia of Pregnancy, Labour and Puerpery, and its Connexion with Bright's Disease.* By Dr. KRASSING. (Monatschr. f. Geburtsk., Mai, 1860.)

1. Dr. Vocke gives an interesting case of puerperal inflammation of the Fallopian tubes, a disease lately described by Martin and Forster.

A woman, aged twenty-four, had suffered a blow in the left side two days before accession of labour. There was no bad symptom for the first eight days, but early on the ninth day the patient was seized suddenly with severe pains, as if from a blow in the region of the left ovary; she screamed out, and continued to suffer the pain until her death, forty-six hours after. The symptoms indicated peritonitis from perforation. The autopsy showed several quarts of purulent serous fluid in the abdomen; the parietal and visceral peritoneum of the left side was covered with purulent exudation and fibrinous shreds. All these appearances were most marked in the exact neighbourhood of the abdominal opening of the left Fallopian tube; and it was clear that this was the starting-point of the peritonitis. The left tube was dilated, and when its walls were gently squeezed, pus flowed out by the abdominal opening its mucous membrane was strongly injected. The right tube was normal.

2. Dr. Krassing gives the following analytical summary of 19 cases of convulsions:

1. Of the patients 11 were from eighteen to twenty-five years of age, 5 from twenty-six to thirty-eight.

2. Eclampsia occurred in the proportion of 1 in 500 labours.

3. Primiparæ were more frequently attacked than pluriparæ. Of the first there were 10 cases, of the latter 6. Of the latter, two had borne two children previously, and four had borne one child, without eclampsia.

4. There were two cases of twins.

5. The attacks came on mostly without premonitory symptoms: ten times during the period of dilatation of the os uteri; once during an attempted turning, the os uteri being dilated; five times during the puerperal period—three times on the first, one on the second, and one on the eighth day.

6. In the 10 cases occurring during dilatation, pregnancy had reached its normal term in 4; in 4 it had reached the eighth and in 2 the ninth month. The other cases occurred at the regular period of labour.

7. The number of attacks ranged from one to eighty-one, and the period of pregnancy or of puerpery had no influence on the frequency.

8. The duration of the individual attacks varied from one to three minutes only seldom attaining ten minutes.

9. Premonitory symptoms appeared six times.

10. In 1 case only was albumen absent from the urine. In all the rest

there was evidence of Bright's disease. Œdematous infiltration ten times. In 1 case without œdema there occurred eighty-one fits; in 1 without albuminuria, sixty fits.

11. Seven recovered and 9 died. Of those who recovered, 4 had convulsions during labour, 3 during puerpery. The œdema quickly vanished, and the symptoms of Bright's disease disappeared completely after four to fourteen days.

Death happened twice during convulsions, five times during coma, and twice from after diseases.

12. Dissection of 9 cases exhibited: Anæmia and serous soaking of brain, six times; hyperæmia, one; intermeningeal apoplexy, one; nothing abnormal in brain in one. Hyperæmia and inflammatory exudation in kidneys three times; fatty degeneration, four times; atrophy, one; no disease of kidneys, one; œdema of lungs, four times; peritonitis, two; stenosis of the right ureter, one; tubercles in lungs, one.

13. Excepting one breech, all presentations were head. Of the eighteen children (ten boys, eight girls), fifteen were born alive, three dead.

14. *Treatment.*—In the 16 eclamptic women there were five bleedings to the extent of ten ounces. Three of these cases ended fatally, and in 1 there was manifest increase of the attacks. Chloroform inhalations given in 6 cases mostly moderated the attacks. Opiates were given by mouth and in glysters ten times, in large doses until accession of sleep, and did good service. To excite diuresis, lemon-juice, tartaric acid, and gum benzoin were given. Cold wraps and douches were applied to the head.

Forced delivery was not resorted to; but of the 10 cases of the dilatation period the labour was hastened in 4 by the introduction of a flexible catheter; in 1, colpeurysis; in 4, dilatation with the fingers; in 6, the forceps; in 1, turning; in 1, perforation; in 1, the Cæsarean section, during life, was resorted to.

III. The Fœtus.

1. *On Frankenhäuser's Discovery that the Sex of the Child in Utero may be told by Counting the Heart's Pulsations.* By Dr. Breslau. (Monatschr. f. Geb., June, 1860.)
2. *On the same.* By Dr. Hennig. (Op. cit.)
3. *On the same.* By Dr. Haake. (Op. cit.)
4. *On the Funic Souffle, Compression of the Funis, and Compression of the Brain.* By Dr. Frankenhaeuser. (Monatschr. f. Geburtsk., May, 1860.)
5. *On the Weight and Length of New-born Children, &c.* By Ed. Von Siebold. (Monatschr. f. Geb., May, 1860.)
6. *Measurements of the Diameters of the Fœtal Head at Term, collected from 700 Cases of Labour.* By Dr. Van Pelt. (Amer. Journ. of Med. Science, Jan., 1860.)

1. We have not hitherto referred to the presumed discovery of Dr. Frankenhäuser, that the sex of the fœtus in utero might be told by counting its heart-pulsations. It appeared to require further examination by other observers. This want is now partially supplied by the inquiries of Dr. Breslau, Dr. C. Hennig, and Dr. Haake, a summary of whose testimony is now given.

Dr. Breslau first quotes the general statement of Frankenhäuser. Dr. Frankenhäuser says he had examined about 100 women in pregnancy and in labour, with the sole view of ascertaining the difference in the frequency of the pulse in these two conditions. He found a very regular variation, and it turned out that the lower numbers occurred in women who later gave birth to boys, and the higher numbers in those who bore girls. He began then from these data to write down the probable sex of the child, and in this manner foretold the sex fifty times. Of these, twenty-two were boys, twenty-eight girls. The first gave a mean pulse of 124, the latter 144. For boys, the pulse was most frequently twenty, seldom twenty-one, in ten seconds; in girls, very regularly twenty-four, seldom twenty-five, and only once twenty-three. These observations were generally made a month before labour. A corroboration of this theory is found in the facts that also after birth the pulse is more frequent in girls, and that in a smaller degree this difference persists through life.

Dr. Breslau thinks Dr. Frankenhäuser's law is the result of "error and self-deception." In his own observations he did not count by periods of ten seconds, but of fifteen, since an error of one beat would mislead more for the shorter period. He also counted several times. He gives a table containing 50 cases. The results are, that twenty-five times he made a false prophecy, and nineteen times a right one, leaving six doubtful.

He then tested the proposition, that the pulsations are more frequent in girls after birth. He made sixty-seven observations on new-born infants—viz., of thirty-nine boys and twenty-eight girls. The mean of the pulsations in boys was 124 per minute, of the girls 120. Care was taken to avoid error from restlessness of the children during observation.

2. Dr. Hennig has made twelve observations. The boys gave a mean of 143 beats per minute; the girls, 155.

He has examined 120 new-born infants. The mean was the same for both sexes. In a pair of twins, he found the boy had 120 beats, the girl 108, both sleeping.

In the first weeks of life, the pulse during sleep of boys is 121, of girls, 123. In waking children it was about the same. In crying children, the average for boys was 151, for girls, 150.

3. Dr. Haake made observations upon fifty women who were mostly in the seventh or eighth month. The auscultation was conducted by simple apposition of the ear to the abdomen. The period of counting was fifteen seconds, in order to lessen the risk of error when ten seconds is the period taken, as by Frankenhäuser. He also always counted several times. When an acceleration of the pulse occurred through movements of the fœtus, the notation of the result was postponed. He never once succeeded in foretelling the sex of the child, although he carefully observed the cautions of Frankenhäuser. He found the boys to have a mean of 145, the girls 143.

With reference to the difference in the pulse in new-born boys and girls, Dr. Haake says his observations are too few to warrant definite opinions.

The conclusion of these laborious inquiries seems to be, that we are not yet in possession of the promised sure foresight into the proceedings of nature.

4. Dr. Frankenhäuser gives the result of a clinical examination of the sounds heard in the funis of the unborn child, as affected by compression of the funis or of the brain. The funic souffle, according to Dr. Frankenhäuser, is produced by compression of the cord, and he adduces various evidences to support this view. It is chiefly heard in the two latter months of pregnancy. It may disappear for a longer or shorter time after strong movements of the fœtus, whence two observers may differ as to the observation. It is commonly lost after the rupture of the membranes. He says he has heard it in about eight per cent. of cases examined. It is most frequently heard in breech-presentations, and when there are twistings of the cord or knots. In three-fourths of his cases he found twistings of the cord. The thickness of the cord seems of importance. When there is much gelatinous matter in the cord, the funic souffle is not heard, even when there are twistings,

but when the cord is lean and thin, the sound may appear even in loose twistings.

He refers to Kennedy's observation, that the sound could be produced by gently pressing the cord. He says only a gentle compression will cause the sound, and that a stronger one will extinguish it.

With reference to the influence of compression of the brain upon the action of the fœtal heart, he says that when the cranial bones are thin, like parchment, easily yielding, there is commonly a marked retardation of the heart's action during labour; also during the compression exercised by the forceps; also in the case of premature children, whose skulls are unusually compressible. If this compression last long, there follows necessarily an asphyxial empoisonment of the blood, which reacts by increasing the retardation of the circulation, occasioned primarily by the compression.

5. Dr. von Siebold gives the result of his observations upon 3000 new-born infants concerning their weight and length, and the falling off of their weight during the first weeks. His tables are too detailed for extraction at length. The following represents the leading results :—

6 pounds weighed	...	Boys, 126	...	Girls, 142	...	Together, 268
6¼ ,,	...	,, 88	...	,, 79	...	,, 167
6½ ,,	...	,, 132	...	,, 156	...	,, 288
6¾ ,,	...	,, 128	...	,, 152	...	,, 280
7 ,,	...	,, 225	...	,, 201	...	,, 426
7¼ ,,	...	,, 113	...	,, 103	...	,, 216
7½ ,,	...	,, 173	...	,, 137	...	,, 310
7¾ ,,	...	,, 154	...	,, 106	...	,, 260
8 ,,	...	,, 132	...	,, 94	...	,, 226
8¼ ,,	...	,, 48	...	,, 19	...	,, 67

The weights ran between a minimum of 4 pounds and a maximum of 11 pounds. By far the greater number weighed between 6 and 8 pounds. The number springs suddenly from 99 at 5¾ pounds to 268 at 6 pounds, and falls suddenly from 226 at 8 pounds to 67 at 8¼ pounds. Generally, there is a larger proportion of the high weights amongst boys. The great number of children lost from a quarter to half a pound during the first days of life. They remained stationary from the fourth to the sixth day, and then gained weight. The normal gain during the first nine days was a quarter of a pound, and from that date to the fourteenth day the gain was half a pound.

Length.—Three thousand children varied from 15″ to 21″; 695 measured 17″; 101 measured 17·5″; 1674 measured 18″; 61 measured 18·5″; 305 measured 19″. The greater lengths prevailed amongst the boys—thus: of the 695 which measured 17 inches, 380 were girls, and 315 boys; whilst of the 1674 measuring 18 inches, 867 were boys, and 807 girls; and of 305 measuring 19 inches, 198 were boys, and 107 girls.

6. Dr. Van Pelt has made an extensive and valuable series of measurements of fœtal heads. In 646 crania the occipito-mental diameter measured:—

Inches.		Inches.	
$4\frac{15}{16}$ths	in 8	$5\frac{8}{16}$ths	in 115
5	in 25	$5\frac{9}{16}$ths	in 52
$5\frac{1}{16}$ths	in 20	$5\frac{10}{16}$ths	in 48
$5\frac{2}{16}$ths	in 29	$5\frac{11}{16}$ths	in 37
$5\frac{3}{16}$ths	in 29	$5\frac{12}{16}$ths	in 22
$5\frac{4}{16}$ths	in 61	$5\frac{13}{16}$ths	in 13
$5\frac{5}{16}$ths	in 56	$5\frac{14}{16}$ths	in 9
$5\frac{6}{16}$ths	in 54	$5\frac{15}{16}$ths	in 3
$5\frac{7}{16}$ths	in 62	6	in 3

The average of this diameter was 5·42″.

In 646 crania the occipito-frontal diameter measured—

Inches.
$4\frac{1}{16}$ths in 4
$4\frac{2}{16}$ths in 8
$4\frac{3}{16}$ths in 6
$4\frac{4}{16}$ths in 13
$4\frac{5}{16}$ths in 19
$4\frac{6}{16}$ths in 18
$4\frac{7}{16}$ths in 27
$4\frac{8}{16}$ths in 37
$4\frac{9}{16}$ths in 48
$4\frac{10}{16}$ths in 63

Inches.
$4\frac{11}{16}$ths in 77
$4\frac{12}{16}$ths in 81
$4\frac{13}{16}$ths in 77
$4\frac{14}{16}$ths in 76
$4\frac{15}{16}$ths in 30
5 in 37
$5\frac{1}{16}$ths in 18
$5\frac{2}{16}$ths in 6
$5\frac{3}{16}$ths in 1

The average of this diameter was 4·7″.

In 646 cases the bi-parietal diameter was—

Inches.
$3\frac{4}{16}$ths in 7
$3\frac{5}{16}$ths in 8
$3\frac{6}{16}$ths in 16
$3\frac{7}{16}$ths in 14
$3\frac{8}{16}$ths in 30
$3\frac{9}{16}$ths in 47
$3\frac{10}{16}$ths in 72
$3\frac{11}{16}$ths in 78
$3\frac{12}{16}$ths in 132

Inches.
$3\frac{13}{16}$ths in 82
$3\frac{14}{16}$ths in 72
$3\frac{15}{16}$ths in 31
4 in 35
$4\frac{1}{16}$ths in 11
$4\frac{2}{16}$ths in 6
$4\frac{3}{16}$ths in 2
$4\frac{4}{16}$ths in 1

The average of this diameter was 3·7″.

Dr. Van Pelt then gives a table of the measurements of the same diameters by previous observers. He remarks that the dimensions found by himself, Dr. Hewson, and Dr. Meigs are far greater than those recorded by any non-American author, and suggests that the difference is to be decided by ethnological investigations. He does not give any distinct results of the measurements of male and female heads, but shows that a greater number of high diameters were observed in males.

THERAPEUTICAL RECORD.

On a Case of Traumatic Tetanus treated with success by Injections of Sulphate of Atropia.[*]—Dr. Dupuy has recorded a case of traumatic tetanus in which the subcutaneous injection of sulphate of atropia was employed with success. The patient was a young man who had suffered a comminuted fracture of the index finger, followed by tetanus. Extract of belladonna was administered without any appreciable effect, and the tincture was equally unsuccessful. The surgeons in attendance removed the splinters of bone under the use of anæsthetics, but on awaking, the patient was more agitated than before; the jaws could scarcely be opened, and the trunk rested only upon the occiput and the pelvis. The dose of extract of belladonna was doubled, but without apparent effect. As the disease was still advancing, and the means hitherto employed were unsuccessful, it was determined to inject with sulphate of atropia. Twenty-five drops of a solution were injected by means of a syringe into the subcutaneous tissue of the lumbar region. At the end of a quarter of an hour there were symptoms of poisoning by belladonna, the agitation of the patient being so great that two persons could scarcely restrain him. This state continued for some time, after which he fell asleep for three hours. The stiffness of the lower limbs then diminished and the patient could bend his knees, but the opisthotonos and trismus remained. Another injection was performed in the lumbar region, and was also followed by symptoms of poisoning. The patient afterwards slept for five hours, and from this time the symptoms gradually diminished; the wound being dressed with a pommade containing belladonna. It is remarked as an extraordinary fact that the belladonna, administered in a full dose by the stomach, produced no effect, while the same medicine introduced into the economy by subcutaneous injection produced a rapidly curative action.

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[*] Gazette Médicale de Lyon. May, 1860.

On the Employment of Propylamine in Rheumatism.[*] — Dr. Arvenarius, of St. Petersburg, was the first physician who employed propylamine in medicine. In the space of two years, from 1854 to 1856, he treated successfully more than 250 patients attacked with chronic or acute rheumatism. In cases of acute rheumatism, he states that the pain and fever always disappeared on the day after the administration of the medicine. The form in which he gave it was in a mixture of twenty drops of propylamine with forty-five drachms of distilled water; a tablespoonful to be taken every two hours. It appears that the use of propylamine in medicine is increasing in America. This substance was discovered in 1850, and is obtained either by acting on iodide of propylene by ammonia, or by extracting it from bodies which contain it. It is found naturally in the flowers of the hawthorn, in the fruit of the mountain ash, and in the chenopodium vulgare. But it is obtained most easily and abundantly from the brine of salted herrings, which contains it in considerable quantity in combination with an acid, from which it may be separated by distillation with potash. Propylamine is a colourless, transparent liquid, having a strong smell resembling ammonia. It is soluble in water, and presents a strong alkaline reaction, even in a weak solution. It saturates acids and forms crystallizable salts. Like ammonia, it produces white fumes when in contact with hydrochloric-acid gas. Its composition may be represented as one equivalent of propylene and one of ammonia $= C_6H_6 + NH_3$.

On Iodism.[†]—In a recent discussion on iodism at the Académie Impériale de Médecine, M. Velpeau made the following observations:—He had treated about fifteen thousand persons with iodine, either externally or internally, but he had never seen anything exactly resembling constitutional iodism. He had observed irritation of the digestive organs, pains in the stomach, dyspepsia, roughness of the throat, irritation of the mucous membranes of the mouth and nose, ptyalism, &c., but he had never seen cases of rapid emaciation, with atrophy of the breasts and testicles, and bulimia, or, in short, with symptoms of poisoning. M. Velpeau suggests that the difference of the results observed in Paris and Geneva may be due to the difference in the doses employed, or the varying qualities of the iodized preparations; but whatever may be the reasons of the discrepancy, he has never seen in Paris any cases of what M. Rilliet has called *constitutional iodism.*

On the Employment of Iodide of Ammonium in Constitutional Syphilis.[‡]—Dr. Gamberini, of Bologna, relates fourteen cases treated by iodide of ammonium, and he draws the conclusion that this agent is a prompt and efficacious remedy in all those cases in which the iodides of potassium and sodium are usually employed. He considers the iodide of ammonium to be preferable to the other iodides, because, while effecting the same results, it has the advantage of acting more rapidly, and also because strong doses of iodide of potassium or sodium are required to obtain results which are secured by a very small dose of iodide of ammonium. The terminal dose of the latter being the same as the commencing dose of the other iodides, the expense of treatment is very considerably reduced.

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[*] Gazette de Lyon. April, 1860. [†] L'Union Médicale. March 22nd, 1860.

[‡] Bulletino delle Scienze Mediche. Nov. 1859.

*On the Efficacy of Digitalis and Quinine in the Treatment of Hemicrania.**—Dr. Debout, who has very severely suffered for many years from attacks of hemicrania, testifies to the efficacy of the combined use of sulphate of quinine and powder of digitalis in the treatment of this complaint. The proportions employed are three grammes (about three-fourths of a drachm) of sulphate of quinine, and one and a half gramme of powdered digitalis, made into thirty pills, of which one is to be taken every night at bedtime for at least three months. From the beneficial effects produced on himself, Dr. Debout prescribed the same treatment for several patients, and the results, in many cases, were equally satisfactory.

On the Therapeutical Properties of Bromide of Potassium.†—According to the researches of M. Huette, the administration of the bromide of potassium produces prostration of strength, difficulty in moving, diminution of general sensibility, anæsthesia of the mucous membrane of the palate and larynx, and more or less torpor of the genital organs. M. Thielmann has employed this salt successfully in the treatment of painful erections, satyriasis, and spermatorrhœa. Dr. Pfeiffer has obtained the same results, and has used the bromide in abnormal erections, neuralgia of the neck of the bladder, catarrh of the urinary passages, and gravel. The efficacy of the mineral water of Kreuznach in the latter affections is due to the large quantity of bromide of potassium and magnesium contained in this water. M. Pfeiffer administers the bromide of potassium in the dose of fifty centigrammes, raising it progressively to two or three grammes (ʒss to three-fourths of a drachm); he gives it in two doses, night and morning, or in doses otherwise divided to suit particular constitutions.

On the Physiological Action of Hellebore.‡—Dr. Schroff, who has made many interesting investigations upon the poisonous properties of the different species of hellebore, has lately made some further experiments with a view to determine the relative rank which each ought to hold in a toxicological point of view. From a series of observations made upon rabbits, Dr. Schroff has come to the conclusion that the different species of hellebore differ very widely in their properties, some being very poisonous, while others are comparatively inert. The helleborus niger is the most deficient in active principles, and next in order of activity comes the H. ponticus, then the H. purpurascens, and at the head of the list is the H. orientalis, the indigenous black sneezewort of ancient Greece, and which is the true representative of the active hellebores. The poisonous properties of the hellebores are chiefly due to the acrid principle, and not to the narcotic, although the hellebores, like the aconites, are both acrid and narcotic; thus the helleborus niger contains only narcotic principles and is the least poisonous, while the H. viridis, and especially the H. orientalis (which is the most poisonous), contain a large proportion of acrid matter.

On the Use of Tannin in large doses in Albuminous Anasarca.§—A case is recorded in which the use of tannin appears to have been attended with favourable results in the removal of anasarca. The patient was in an advanced stage of the disease, the face and whole body being anasarcous, and the urine being loaded with albumen. Small doses of tannin and tonics were employed without effect, and the patient fell into a semi-comatose condition, with slight convul-

* Bulletin Général de Thérapeutique, April 15th, 1860. † Ibid.

‡ Zeitschrift der Gesellschaft der Aerzte zu Wien. June 18th, 1860.

§ L'Union Médicale. April, 1860.

sive movements of the lower limbs, and dilatation of the pupils. The tannin was again employed in the dose of half a drachm, and under its use the anasarca gradually disappeared, the patient regained his consciousness, and eventually he entirely recovered.

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